

GEORGIA
LSAMP SCHOLAR
HANDBOOK
Clark Atlanta University Campus



Name _____

Academic Major _____

Classification _____

Date Entered Program _____

GEORGIA LSAMP SCHOLAR HANDBOOK

INTRODUCTION TO THE GEORGIA LSAMP PROGRAM

The Georgia LSAMP (Louis Stokes Alliance for Minority Participation) program is one of forty-one LSAMP programs in the United States and its possessions. The program exists to assist undergraduate science, technology, engineering, and mathematics (STEM) students to succeed in their undergraduate education, gain acceptance into a quality STEM graduate program, and keep in touch after entering their working careers. Individual LSAMP programs are organized according to the *LSAMP Model*. In the LSAMP Model scholars participate in summer and academic-year research projects, tutor their peers, mentor and serve as role models for high school and younger students, prepare for the GRE exam, present their research results in local and national forums, receive academic advising and research mentoring, and participate in skills-building workshops and seminars.

The Georgia LSAMP began in 1997 with seven collaborating institutions: Atlanta Metropolitan College, Clark Atlanta University, Georgia State University, Morehouse College, Morris Brown College, Paine College, and Spelman College. Morris Brown College dropped out of the alliance in 2001 due to a severe decrease in enrollment. Spelman College left the alliance in 2009 for administrative reasons. Thus the membership of the Georgia alliance now consists of Atlanta Metropolitan College, Clark Atlanta University, Georgia State University, Morehouse College, and Paine College.

A Governing Board consisting of the presidents of the five participating LSAMP institutions guides the program to work toward unified goals. A National Advisory Committee composed of members from industry, higher education, and government agencies assists the Governing Board to evaluate progress toward achievement of program goals.

Dr. Carlton Brown, President of CAU, is the Principal Investigator of the Georgia LSAMP program. His office is located on the third floor of Harkness Hall. He may be reached at 404-880-8500 or cbrown@cau.edu. He heads the Governing Board and is ultimately responsible for the conduct and accomplishments of the program.

Dr. Randal Mandock, the Georgia LSAMP Program Director (PD), divides his time between his office in Room 2013 at the Thomas Cole Research Center for Science and Technology (RCST) and the Earth System Science Program (ESSP) Instructional Laboratory in MD 117. He may be contacted at 404-880-6904 (office), 404-880-6109 (Instructional Lab), 678-485-3374 (cellular phone), or rmandock@cau.edu. See him for academic and research mentoring, career advising, research guidance, assistance with statements of work and progress reports, and field trip preparations. He is part of the team (Program Manager, Program Coordinator, and PD) that can listen to concerns of a non-academic nature.

Administrative paperwork and forms are managed by the Program Manager (PM), Carlos Garza. See him for general information about the LSAMP program, ethical behavior, professional etiquette, student stipend requirements, announcements, deadlines, field trip dates and times, student meetings and other activities, travel, and related concerns. The Program Coordinator (PC), Donnita Raglin, manages student tracking, surveys, tutoring, and reporting. She is a good source of guidance for planning your professional and career activities. Do not hesitate to meet with either of these managers when the need arises. Mr. Garza can be reached at 404-880-6903 and cgarza@cau.edu. Mrs. Raglin can be reached at 404-880-6907 and draglin@cau.edu.

The LSAMP management team at CAU is assisted by an Interdisciplinary Faculty Team composed of five CAU professors: Dr. Marjorie Campbell, Dr. Peter Molnar, Dr. Paul Musey, Dr. Cass Parker, and Dr. Sandra Rucker. These faculty advise on program activities, mentor LSAMP scholars, develop the LSAMP website, participate in LSAMP activities, and play a leadership role in the Summer Research Explorer program.

The offices of the Georgia LSAMP program at CAU reside in the office suite at Room 2013 of the RCST. Other locations available to LSAMP students include the research laboratory in Room 2004, the Penthouse laboratory on the south roof of the RCST, the Environmental Sensor Platform on the north roof of the RCST, and the ESSP Instructional Laboratory in McPheeters Dennis Room 117.

The distinguishing mark of the LSAMP program is collaboration among LSAMP institutions. This collaboration can take the form of cross-institutional research projects, an inter-institutional student council, scientific field trips, full representation at conferences and symposia, and other collaborative efforts. We are working to organize an all-alliance STEM Student Council. You will learn more about this at the monthly meetings and bi-annual symposia.

Each LSAMP program is distinguished by one or more unifying themes. The unifying themes for the Georgia LSAMP are peer and K-12 tutoring, scientific field trips, a research symposium every semester, and the Summer Research Explorer (SRE) program. Although peer tutoring has long been a common factor among the partner institutions, the SRE, research symposia, and scientific field trips are recent additions. Field trips to the Fernbank Science Center, Henderson Waterfall, and Stone Mountain are lead by Dr. Randal Mandock on most Saturdays of the academic year and during the SRE. We encourage you to work together to add a Georgia LSAMP Scholar Journal as a new unifying theme, and a STEM Student Council.

The scientific field trips expand the participant's environmental knowledge, are physically challenging, develop new and stronger friendships, and provide unique opportunities to experience much of what nature has to offer. Students on the field trips learn how to identify rocks and minerals characteristic of the southern Appalachian Mountains, how to measure rock structures to understand their origin, how stream flow cuts banks and produces point bars, how Stone Mountain and the Atlanta Group of metamorphic rocks came about, and how to identify weather sensors and meteorites.

The SRE program began in 2010 with two LSAMP scholars and one teacher. These three worked together on an environmental project that was presented to members of the U.S. Congress in the fourth week of the program. The SRE has been expanded to serve up to ten scholars in 2011. Research training projects can include development of an interactive computer simulation, robotics, microclimate modeling, the hydrologic cycle, earthquake analysis, influence of solar electromagnetic flux variability on regional temperature, and influence of solar wind variations on regional temperature.

All LSAMP activities are documented for reporting and evaluation purposes. Documentation helps us keep track of your progress and our performance. Please complete all statements of work, monthly progress reports, surveys, and evaluations. Be sure to sign all sign-in sheets for every activity in which you participate.

High quality scientific research requires training in professional ethics. LSAMP seminars, symposia, and meetings are designed to help train you in this area. Your source of financial support, the National Science Foundation (NSF), requires you to complete training in the responsible conduct of research. The NSF training requirement can be met by completion of the appropriate curriculum at <http://www.citiprogram.org>. This is the website of the Collaborative Institutional Training Initiative (CITI). CITI training not only prepares you to conduct research responsibly, but also satisfies the requirements of the CAU Institutional Review Board (IRB) for human subjects research. See the LSAMP Program Manager or Program Coordinator for information on how to register for a CITI training course.

LIST OF LSAMP SCHOLAR REQUIREMENTS

1. Attend monthly LSAMP meetings; absences must be approved by the Program Manager.
2. Attend scheduled LSAMP workshops and seminars (two or three per semester). Show up on time.
3. Attend weekly seminars¹ in your academic department, another academic department, or the Physics Department (Dr. Mandock is running the Physics seminar this year: Thursdays at 3:05 p.m. in MD 143). The seminar head must initial your *Reporting, Activity, and Award Checklist* every week.
4. Attend three conference, symposium, or national/regional meetings per year. The two Georgia LSAMP research symposia are mandatory and can count as two of these meetings.
5. Tutor a minimum of four hours per month. Must record on a *Tutorial Sessions* form the dates, times, and names of students tutored. Turn in the *Tutorial Sessions* form at the end of every month. Students tutored can be college students or students at the K-12 level. See Appendix A.

6. Service to K-12 schools² a minimum of two hours per month. Tutoring at this level can be used to meet *both* this requirement and Requirement 5 above. Record dates, times, and locations of service. Turn in a *Service to K-12 Schools* form for review at the end of every month. See Appendix B.
7. Complete a research or research training project during the academic year. Turn in a research update by 15 December and a research report by 15 May. A description of these reports is given in a later section of this handbook.
8. Complete a summer internship in order to be eligible to continue as a scholar in the Fall semester.
9. Present a poster or make an oral presentation of your work at least one time per calendar year.
10. Complete the *Reporting, Activity, and Award Checklist* on a weekly basis. Present your *Activity and Award Report* to the Program Manager (PM) for sign off at the end of every month and your *Reporting, Activity, and Award Checklist* for review every month. See Appendix C.
11. Turn in sign-in and sign-up sheets for all scientific demonstrations at K-12 schools. See Appendix D.
12. Meet with your research advisor weekly. Your research advisor must initial your *Reporting, Activity, and Award Checklist* every week. Be sure to get your advisor's signature as soon as possible on the *LSAMP Research Advisor Sign-Off* sheet. See Appendix E.
13. Turn in a signed Statement of Work as soon as possible. See Appendix F.
14. Turn in a progress report at the end of every month. Use the template shown in Appendix G. A progress timeline must accompany each progress report. Progress reports must show significant research and related activities.
15. Turn in all travel documents as described below in the travel section.
16. Go on one LSAMP field trip per semester.³
17. Regular attendance at the student society or club in your major is mandatory.
18. Acceptance into the program requires a minimum GPA of 3.0.⁴
19. A scholar is on probation if the GPA falls below 3.0.⁵

¹ An LSAMP seminar can be substituted for one of the weekly departmental seminars.

² Service at K-12 schools, service to the Georgia LSAMP program in outreach to K-12 schools, leadership participation in science fairs, and collaborative K-12 activities can meet this requirement.

³ An exception can be made for students with special circumstances.

⁴ Students with exceptional qualifications and GPA ≥ 2.7 can be accepted.

⁵ The condition for continuance as a probational scholar is a continually increasing GPA every succeeding semester until ≥ 3.0 .

DEADLINES

1. Return the *LSAMP Research Advisor Sign-Off* sheet within 15 days of receipt of this handbook.
2. Submit a signed Statement of Work within 21 days of receipt of this handbook.
3. Submit a signed *Service to K-12 Schools* form within 30 days of assignment to a school.
4. Submit a signed progress report by the end of each month. Tutoring and service forms must accompany the progress report. See the Program Manager for specific monthly deadlines.
5. Register for all conferences, symposia, and meetings by the registration deadline.
6. Submit conference, symposia, and meeting abstracts by the submission deadline.

NAVIGATING THE GEORGIA LSAMP PROGRAM

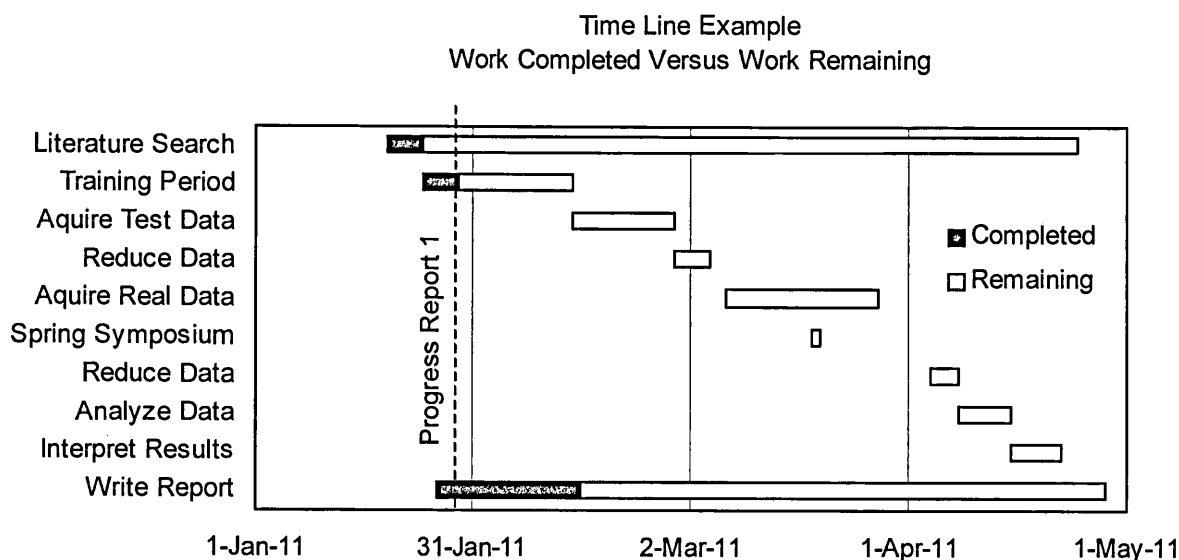
Dr. Carlton Brown leads the Georgia LSAMP program, Dr. Randal Mandock directs it, and Brenda Tillman and Carlos Garza manage it. Your Research Advisor is your immediate supervisor on your research project; Miss Tillman is your immediate supervisor for most other LSAMP activities. Dr. Mandock will assist you with any research or academic problem not resolved by Miss Tillman or your Research Advisor. Mr. Garza is available to assist when Dr. Mandock is unavailable. Mr. Garza will help arrange your tutoring and K-12 service schedules.

RCST Room 2013 consists of five suites: A-E. Suites C and E in this office complex may be used by LSAMP scholars for LSAMP activities, such as preparing for a conference, waiting for an appointment,

coordinating with other LSAMP scholars or tutored students, etc. Suite C is an office, while Suite E is the reception area. RCST Room 2017 is a conference room assigned to the Physics Department. Occasional meetings of chemistry and physics faculty take place in this room, as do other Chemistry Department activities. However, most of the time the room is empty and available for LSAMP activities. Consider this room your space when it is not in use. You may meet, study, do research, tutor, or conduct any other LSAMP activity in this room. Contact the Program Manager about access to the room after business hours.

TIMELINE TEMPLATE

The Gantt chart shown below is a good tool for project planning and tracking. Because it can be of such great value to your future career, you are required to create one at the beginning of each project (at least



once per academic year) and update it each time you submit a monthly progress report. Microsoft Project contains a function for creating Gantt charts, but you can also create one manually with MS Excel. You will receive a template file with this handbook that will help you create your chart with MS Excel. The parameters in the spreadsheet are: (1) date, (2) number of days on task completed, (3) number of days on task remaining, and (4) task name.

RESEARCH OBLIGATIONS

Your research obligation to the LSAMP program during the academic year is a minimum of 3 hours per week and a maximum of 5. Those scholars who are supported by both LSAMP and another research program will be governed by the work requirements of the other program. Under no circumstances will a scholar be required to work more than 20 hours per week. This is the maximum commitment the University will allow.

The LSAMP program requires you to complete a summer research experience. The research experience can be an internship, participation in an REU or the Georgia LSAMP SRE program, or a summer job within your academic field. There are a large number of research opportunities available to you. Apply early to improve your chances of being accepted by your first choice. Contact the Program Manager if you are unable to secure a summer research position.

RESEARCH UPDATE AND REPORT

The research update is a short report on your progress during the semester. It consists of text and a couple of figures or tables that describe your literature review, a statement of your research problem, a description of your research methodology and analysis tools, a discussion of any results you may have obtained, and a list of references cited. The research update is to be a brief single-spaced document, 400-600 words in length, and not to exceed three pages. It is from this document that you will begin preparation of your poster and oral presentations.

The research report is a comprehensive description of your research project. It is an expanded version of your research update that includes an abstract, literature review, statement of your research problem, a description of the research methodology and analysis tools actually used, a discussion of your research results, a conclusion and recommendations for future work, acknowledgments, and a properly-formatted list of references cited. The report is a single-spaced document, 1,000-2,500 words in length, illustrated with tables and figures, and not to exceed eight pages.

KEEPING TRACK OF YOUR LSAMP ACTIVITIES

An *Activity and Award* reporting form and checklist are included in Appendix C. Typical activities are listed on the checklist. Other activities can include peer mentoring, serving as science fair judges, significant club or society activities (e.g., field trip to a government or private lab, observatory, or energy facility), publishing, etc. Fill in a new row on the reporting form every time you complete an LSAMP activity or receive an award. Sign your initials after each entry. Record awards at the bottom of the checklist. Present the *Activity and Award* reporting form to the Program Manager at the end of every month for sign off. Turn in both forms at the end of the semester. They serve as one measure of your progress through the LSAMP program.

CAREER DEVELOPMENT

Career development is the *raison d'être* for the Georgia LSAMP program. One key element in career development is active membership in professional societies and student chapters of these societies. You are required to be an active member of either a student chapter of a professional society or a campus organization in your major. You are strongly urged to be an active student member of a professional society in addition to belonging to a student chapter of that same society or another.

SERVICE TO K-12 SCHOOLS

Service to K-12 schools can take many forms: tutoring, giving scientific demonstrations, assisting a science teacher in the classroom, serving at a science fair, leading students on a scientific field trip, and others. Two forms are included in Appendix D for documenting K-12 student participation in a scientific demonstration: (A) a student sign-in sheet, and (B) a student sign-up sheet. The sign-in sheet records the names of students who attended the demonstration. Students who would like information about enrolling in an alliance school will write their contact information on the sign-up sheet.

OFFICIAL TRAVEL

You may travel to conferences, symposia, meetings, workshops, etc. under LSAMP sponsorship. Scholars who receive a travel award are required to fill out a *Travel Requisition Form* at least one month prior to your official travel date: the earlier the better. You must turn in all receipts, boarding passes, and invoices as soon as you return to Atlanta. These will be attached to a *Travel Expense Report Form*. The Program Manager will provide you the necessary forms.

STATEMENTS OF WORK AND PROGRESS REPORTS

Statements of Work (SOW) are used to define the objectives, expected outcomes, tasks, and scope of an assigned project. They are your guide to how, when, and where to conduct your research assignment. A well-written SOW will guide development of your project plan and of your Gantt chart. The SOW is also used to write progress reports. The same introduction to your research assignment that is found in the SOW can be used in your progress reports. The SOW and progress reports should be written in such a way that an auditor unfamiliar with your research will be able to assess the project tasks and your accomplishments and research progress. An SOW template and an example SOW are shown in Appendix F. A progress report template and an example progress report are shown in Appendix G.

You will receive a copy of this handbook on a flash drive for efficient editing of the templates. When preparing your Statement of Work and monthly Progress Reports, be sure to delete the word "TEMPLATE" from the templates in Appendices F and G.

PROGRAM TRACKING

LSAMP is a program that reports to the U.S. Congress on the success of its scholars. In order to provide the House members and senators the most up-to-date information about the activities and successes of our scholars, we document your significant research, academic, and outreach activities from the day you enter the program until you are well into your working career. The most important success stories usually take place after you have completed your academic studies and are working as a scientist, mathematician, faculty member, or engineer. However, even undergraduate scholars are capable of major accomplishments. We need to be aware of all of these so we can report them to the National Science Foundation. Appendix H is a summary of some of the templates that we use to keep track of your activities and accomplishments..

APPENDIX A

GEORGIA LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION (GEORGIA LSAMP)

CLARK ATLANTA UNIVERSITY

TUTORIAL SESSIONS – COLLEGE LEVEL

SEMESTER AND YEAR _____

Tutor _____ Location _____

STUDENT SIGN-IN SHEET

	Printed Name	Initials	Classification	Academic Major	Course Tutored	Date
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						

GEORGIA LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION (LSAMP)

CLARK ATLANTA UNIVERSITY

TUTORIAL SESSIONS – 1ST THROUGH 12TH GRADE

SEMESTER AND YEAR _____

Tutor _____ Location _____

STUDENT SIGN-IN SHEET

Printed Name	Initials	Grade	School	Teacher's Name	Date
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					

APPENDIX C

GEORGIA LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION (LSAMP)

CLARK ATLANTA UNIVERSITY ACTIVITY AND AWARD REPORT

SEMESTER AND YEAR _____

Name _____ Signature _____

Activity or Award	Initials	Date	Location	PM Sign Off	Date

GEORGIA LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION (LSAMP)

CLARK ATLANTA UNIVERSITY

REPORTING, ACTIVITY, AND AWARD CHECKLIST

SEMESTER AND YEAR _____

DATE(S)	ACTIVITY	DATE	INITIALS	ACTIVITY
_____	Statement of Work	_____	_____	Meeting with Advisor – Week 1
_____	Research Advisor Sign-Off	_____	_____	Meeting with Advisor – Week 2
_____	Progress Report 1	_____	_____	Meeting with Advisor – Week 3
_____	Progress Report 2	_____	_____	Meeting with Advisor – Week 4
_____	Progress Report 3	_____	_____	Meeting with Advisor – Week 5
_____	LSAMP Meeting – Month 1	_____	_____	Meeting with Advisor – Week 6
_____	LSAMP Meeting – Month 2	_____	_____	Meeting with Advisor – Week 7
_____	LSAMP Meeting – Month 3	_____	_____	Meeting with Advisor – Week 8
_____	LSAMP Workshop/Seminar 1	_____	_____	Meeting with Advisor – Week 9
_____	LSAMP Workshop/Seminar 2	_____	_____	Meeting with Advisor – Week 10
_____	LSAMP Workshop/Seminar 3	_____	_____	Departmental Seminar – Week 1
_____	Tutoring – Month 1	_____	_____	Departmental Seminar – Week 2
_____	Tutoring – Month 2	_____	_____	Departmental Seminar – Week 3
_____	Tutoring – Month 3	_____	_____	Departmental Seminar – Week 4
_____	Field Trips	_____	_____	Departmental Seminar – Week 5
_____	Service to K-12 Schools – Month 1	_____	_____	Departmental Seminar – Week 6
_____	Service to K-12 Schools – Month 2	_____	_____	Departmental Seminar – Week 7
_____	Service to K-12 Schools – Month 3	_____	_____	Departmental Seminar – Week 8
_____	GA LSAMP Symposium	_____	_____	Departmental Seminar – Week 9
_____	Poster or Oral Presentation	_____	_____	Departmental Seminar – Week 10
_____		_____	_____	
_____		_____	_____	
_____		_____	_____	
_____		_____	_____	

CONTINUE ON BACK OR ATTACH ADDITIONAL SHEET IF NECESSARY

APPENDIX D

CLARK ATLANTA UNIVERSITY SCIENCE DEMONSTRATION SIGN-IN SHEET

SPEAKER _____

LOCATION _____ DATE _____

TOPIC _____

PRINTED NAME

SIGNATURE

PRINTED NAME	SIGNATURE
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	
11.	
12.	
13.	
14.	
15.	
16.	
17.	
18.	

CLARK ATLANTA UNIVERSITY
SCIENCE DEMONSTRATION
SIGN-UP SHEET

SPEAKER _____

LOCATION _____ DATE _____

TOPIC _____

PRINTED NAME	CONTACT INFORMATION (EMAIL, PHONE, ADDRESS)
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

APPENDIX E

LSAMP RESEARCH ADVISOR SIGN-OFF

SEPTEMBER 2012

Clark Atlanta University, Atlanta, GA

The Georgia LSAMP program is a support opportunity for undergraduate STEM (science, technology, engineering, and mathematics) students to receive research advisement and career mentoring. Selected students are referred to as LSAMP Scholars. In addition to receiving advisement and mentoring, scholars conduct research, present and publish their results, tutor their peers, serve in K-12 schools, and participate in other career-broadening activities.

In serving as research advisor/mentor to an LSAMP scholar, I agree to work with the LSAMP program to facilitate the scholar's entry into a career as a STEM professional or entrepreneur. I will help the scholar prepare for the Georgia LSAMP local symposium each semester. I will read the *Georgia LSAMP Advisor's Handbook* and keep up to date on the scholar's academic as well as research progress. I will suggest improvements to the handbook as the occasion may arise.

Name of Student _____

Student's Signature _____ Date _____

Name of Research Advisor _____

Research Advisor's Signature _____ Date _____

APPENDIX F

LSAMP SCHOLAR STATEMENT OF WORK TEMPLATE

FALL 2012 (SEPTEMBER - DECEMBER)

Clark Atlanta University, Atlanta, GA

Student Name: _____ **Student ID:** _____
Faculty Research Supervisor: _____
Department: _____
Program Title: Louis Stokes Alliances for Minority Participation (LSAMP)
Grant Agency Acknowledgment: National Science Foundation (NSF)
Grant #: HRD-0503372
CAU Budget Codes: 215023-7604

Statement of Work

PROJECT TITLE

Detailed description of project. Include introductory background, purpose, objectives, and expected outcomes. See example below.

1. Description of Task 1. Can include a deadline date.
2. Description of Task 2.
3. Description of Task 3.
4. Description of Task 4.
- ⋮
10. Submit a report and a poster or PowerPoint presentation at the end of the research period describing the project purpose, design, implementation, protocol, accomplishments, results of the research, and recommendations for future work. Poster or presentation development should take place while the research is being performed during the academic year.

Number of Hours Per Week Student Will Work: _____

Signatures: _____
Student Date Research Advisor Date

Signature: _____
LSAMP PD Date

**EXAMPLE RESEARCH ASSISTANT STATEMENT OF WORK
FALL 2004 (SEPTEMBER - DECEMBER)**

Clark Atlanta University, Atlanta, GA

Student Name:

Student ID:

Faculty Research Supervisors:

Department:

Program Title:

Grant Agency Acknowledgment:

Grant #:

CAU Budget Code:

Statement of Work

ENHANCEMENTS TO CAU'S 2ND-GENERATION LED SUN PHOTOMETER

CAU's Earth System Science Program (ESSP) operates several instruments that monitor the amount of solar energy transmitted through the atmosphere during the day. Some of these instruments measure the entire spectrum of radiation from the ultraviolet through the infrared. Others measure either the visible component or the infrared component. The remaining instruments measure a small portion of the spectrum in narrow wavelength bands. This last type of instrument can be used to determine the amount of absorption or scattering of solar energy by individual species in the atmosphere such as aerosols, water vapor and ozone.

We are testing three systems with different levels of sensitivity and wavelength selectivity. The first instrument is a precision, platform-based, multi-frequency rotating shadow-band radiometer (MFRSR) manufactured by Yankee Instruments, Inc. It measures the direct, diffuse and total radiation in 6 wavelength bands (415, 500, 610, 665, 862 and 940 nm; 10 nm bandwidth). The second is a handheld, 5-filter "Microtops II Sunphotometer," manufactured by Solar Light Company, Inc. It measures the ozone column depth using three wavelengths (305, 312.5, and 320.5 nm; 2.4 nm bandwidth). It also measures the amount of precipitable water (940 nm; 10 nm bandwidth) and the aerosol optical depth at 1020 nm (10 nm bandwidth). We are also enhancing our own second-generation LED sun photometer that uses an LED (light-emitting diode) as a narrow-band (30-60 nm FWHM) detector. Six different visible and near infrared LED sensors are now in operation. Data from these sensors are used to determine the fraction of incident solar energy absorbed by haze (aerosol particles) in the atmosphere.

Our research has shown that measurements made with the 2nd-generation LED sun photometer cannot be compared directly to those measured with the MFRSR and Microtops sensors. We are therefore modifying the photometer design to measure five new wavelengths: (1) water vapor absorption band, (2) water vapor transmission band, (3) ozone absorption band, (4) ozone transmission band, and (5) aerosol absorption band. Measurement of solar direct-beam intensity for these wavelength bands will allow calculation of water vapor, ozone, and aerosol optical depths.

The objectives of this project are to: (1) identify LED absorption and transmission wavelengths for water vapor and ozone; (2) identify an LED absorption band for aerosols; (3) purchase LEDs that detect solar energy in the identified absorption and transmission bands; (4) modify the LED photometer to operate with the new LEDs; (5) acquire absorption and transmission data with the LED photometer; (6) calculate and compare the optical depths acquired by the LED photometer, the MFRSR, and the Microtops sensor; and (7) document the sun photometer circuits. Expected outcomes: (1) the LED photometer should show acceptable comparability with the MFRSR and Microtops sensors; (2) the MFRSR and Microtops sensors will become calibrators for the LED photometer.

1. Work with the ESSP engineer to modify the LED photometer design to incorporate the new LEDs.
2. Work with the ESSP engineer to document the circuits for each of the LED photometers.
3. Work with the ESSP engineer to acquire valid solar spectral data with the LED photometer.
4. Verify the Microtops calibration with the manufacturer, and correct measurements if necessary.
5. Determine a measurement protocol for LED photometer and Microtops measurements.
6. Make Microtops measurements while making LED photometer measurements for intercomparison.
7. Assess comparability and bias of LED photometer and Microtops measurements.
8. Use analysis software available on computers in the ESSP lab to derive Langley plots (the logarithm of the voltage recorded by the photometer versus secant of the zenith angle) and optical thickness for each LED photometer spectral measurement.
9. Submit a report and a poster at the end of the research period describing the project purpose, design, implementation, protocol, accomplishments, results of the research, and recommendations for future work. Poster development should take place while the research is being performed during the academic year.

Number of Hours Per Week Student Will Work: 15

Signatures:

Student

Date

Research Advisor

Date

APPENDIX G

LSAMP SCHOLAR PROGRESS REPORT TEMPLATE

SEPTEMBER 2012

Clark Atlanta University, Atlanta, GA

Student Name: _____ **Student ID:** _____
Faculty Research Supervisor: _____
Department: _____
Project Titles: Louis Stokes Alliances for Minority Participation (LSAMP)
Grant Agency Acknowledgments: National Science Foundation (NSF)
Grant #: HRD-0503372
CAU Budget Codes: 215023-7604

Progress Report

PROJECT TITLE

Detailed description of project. Include introductory background, purpose, objectives, and expected outcomes. These can be taken from the Statement of Work. See example below.

1. Detailed description of completion of Task 1.
2. Detailed description of completion of Task 2.
3. Detailed description of completion of Task 3.
4. Detailed description of completion of Task 4.
- ⋮
5. Description of report write-up and progress toward research poster development.

Number of Hours Per Week Student Worked: _____

Signatures: _____
Student Date Research Advisor Date

Signature: _____
LSAMP PD Date

**EXAMPLE RESEARCH ASSISTANT PROGRESS REPORT
1 NOVEMBER - 15 NOVEMBER 2001
Clark Atlanta University, Atlanta, GA**

Student Name: _____ **Student ID:** _____
Faculty Research Supervisor: _____
Department: _____
Project Titles: _____
Grant Agency Acknowledgments: _____
Grant #: _____
CAU Budget Codes: _____

Progress Report

METEOROLOGICAL ANALYSIS OF MONOSTATIC SODAR DATA

The Aerovironment 300C monostatic sodar is designed to produce a visual record of the vertical distribution of temperature turbulence as it is transported in the mean wind field past the instrument. The visual record is useful for qualitative analysis of the state of the atmospheric boundary layer, but its quantitative content is limited to height and pattern information. A high-speed data acquisition system can sample the raw receive signal from a tap on the preamplifier circuit board. This signal can be used to extract instantaneous Doppler vertical wind speed and backscatter intensity information. The wind speed data can be analyzed to estimate C_v^2 and s_w , the structure parameter for wind speed and the standard deviation of vertical wind speed, respectively. These parameters are related to the dissipation rate of wind turbulence and the momentum flux in the atmospheric boundary layer. The objective of this work is to measure and plot a vertical profile of C_v^2 and s_w for the Atlanta urban boundary layer in order to study how the dissipation rate of wind turbulence profile varies with climate in this layer.

1. Annotated all sodar facsimile records with meteorological and timing information for the month of November.
2. Shellacked and archived the November records.
3. Analyzed and plotted temperature, solar radiation, pressure, relative humidity, wind speed and direction for weather events that occurred in Atlanta during the months of June, July, and August, 2001.
4. Received additional instruction from my research advisor on how to interpret meteorological events on the records, such as fog, rain, frontal passage, low cloud layer, rise and descent of the atmospheric boundary layer, nocturnal waves at the top of the boundary layer, and thermal convective structures during the daytime.
5. In my unpaid internship at CNN International Corporation, I used the Metacast program to predict precipitation, isobars, locate frontal boundaries, insert temperatures of current weather conditions for the U.S. I wrote two reports summarizing what I learned about geography and the AviStar program (which gathers meteorological data from different wires around the world), and I learned how to draw war graphics.
6. Applied my CNN training to the interpretation of sodar records for the urban Atlanta area.
7. Finished technical paper describing construction of the sodar enclosure, significance of sodar observations in the Atlanta urban environment, methods of analysis of sodar record, and correlation of sodar record with surface and upper-air meteorological information.

Number of Hours Per Week Student Worked: 10

Signatures: _____
Student Date Research Advisor Date

APPENDIX H

Academic Year (AY) 2012-2013 Templates

LSAMP AY 2012-2013 Scholar Check-In Procedure Checklist

Scholar Name	Date Application Submitted	Date of Selection by IFT	Date Handbook Received	Date Stipend Form Submitted	Date First Stipend Check Received	Date of Scholar Orientation

Date of Submission (Month/Day) of Signed AY 2012-2013 Statements of Work With Projected Timelines
(3 Signatures: Scholar, Advisor, PM)

Scholar Name	Scholar Class	Project Title	Start Date	Date Signed	Advisor Name

Date of Submission (Month/Day) of Signed AY 2012-2013 Progress Reports With Updated Timelines
(3 Signatures: Scholar, Advisor, PM)

Scholar Name	Report Number								
	1	2	3	4	5	6	7	8	9

LSAMP Fall 2012 Symposium Abstracts

Scholar Name	Abstract Title	Submit Date	Advisor Sign Off	Advisor Name

LSAMP AY 2012-2013 Scholar Travel

Scholar Name	Conference/Symposium/Meeting/Workshop Full Name and Dates (Specify Type of Gathering)	Travel Dates	Date Requisition Submitted	Date Advance Received	Date Expense Form Submitted

LSAMP Summer 2012 Research

Scholar Name	Program/Project Title	Location Date	Advisor Sign Off	Advisor Name

LSAMP 2012 Academic Year Research

Scholar Name	Program/Project Title	Location Date	Advisor Sign Off	Advisor Name