

Career Outcomes Tracking New York City Louis Stokes Alliance for Minority Participation Research Scholars from 1993 to 2022

Dr. Claude Brathwaite, City University of New York, City College

Dr. Claude Brathwaite currently serves as the Director of Student Resources and Services at the City College Grove School of Engineering, utilizing a model of High Impact Practices and Engagement (HIPE). Dr. Brathwaite previously served as the Project Administrator and later Executive Director of the NYC Louis Stokes Alliance. He has also served as the Deputy Director of the City College Black Studies Program, the Director of the City College Black Male Leadership and Mentoring Program and has taught courses in Black Studies and Chemistry at the City College. At the NYC Alliance, he oversaw the day-to-day operation of the NYC Alliance programming across the 18 participating campuses at the City University of New York for 20 years. Dr. Brathwaite began his college education at Hostos Community College, received his BS in Chemistry from the City College of New York and his Ph.D. in Organic Chemistry from the Graduate Center of CUNY. He served as a Chancellors Fellow, and conducted additional postdoctoral training at Weill Cornell in the Division of Molecular Medicine.

CAREER OUTCOMES TRACKING NEW YORK CITY LOUIS STOKES ALLIANCE FOR MINORITY PARTICIPATION RESEARCH SCHOLARS 1993 TO 2022

Abstract

From 1998 to 2018 over 1900 Research Scholars participated in the New York City Louis Stokes Alliance for Minority Participation (NYC LSAMP) at the City University of New York (CUNY). NYC LSAMP Scholars formed the select group of students who were encouraged to move to graduate study. Participation in the NYC LSAMP was defined as being a Research Scholar and included students of the Community, Comprehensive and Senior colleges of the NYC LSAMP. VISION NYC LSAMP, an initiative to incorporate the NYC LSAMP Alums seeks to engage alumni of the program. Two in-person VISION NYC LSAMP sessions were held in 2015 and 2016. An online survey was distributed to over 1900 NYC participants, in combination with developing an active LinkedIn social media plan. The VISION NYC LSAMP survey was initiated in August, 2018, and it received a response rate of 11% of the 1993 invitations. Participants indicated that their range of start date in the NYC LSAMP which goes from Fall 1993 to Summer 2018. Preliminary data shows the top five states in which VISION NYC LSAMP participants are employed are New York (64%), New Jersey (5%), Pennsylvania (4%), Maryland (3%), and California (3%). 16% of those employed remained a part of the City University of New York, and 25% held working positions as a Professor, Tutor, Adjunct, K-12 Teacher. The VISION NYC LSAMP also presents the NextGen roadmap to address the participation of underrepresented minorities in the STEM disciplines by Alumni participants of the programs, now represented in the Professoriate, the K-12, Industry and Agency settings. The updated responses to the 2022 survey will be presented along with data from the LinkedIn tracking data.

Introduction

Participation from all communities across our nation is a national imperative for the US to remain competitive and US higher education programs must produce more graduates in the STEM disciplines. A comprehensive evaluation of Alliance programs nationally in 2006 by the Urban Institute provided a blueprint and recommendations building on best practices by NYC LSAMP members (1991-2004) [1]. In the past two and a half decades the NYC LSAMP has developed a Collaborative Infrastructure across the City University of New York to ensure the university-wide maintenance of a significant pool of underrepresented minorities in the STEM disciplines graduating with BS/BA degrees [2-4]. The Collaborative Infrastructure includes the leadership, financial and physical commitments of three Chancellors, Campus Presidents and Senior Administrators who serve on the Steering Committee, and the dedication of Faculty members who mentor the LSAMP Scholars. From 1992 – 2018, CUNY has experienced enrollment reductions and expansions as well as changes in entrance and graduation requirements.

The City University of New York graduation output of underrepresented minorities rose from 274 in 1994 to 1,529 URM with BA/BS degrees in 2018 at the end of Phase 5 (Phase 1-5, 1992 to 2018). The 2018 graduation numbers are an increase over the previous year of 1,392. From

[Type here]

2011 to 2018, the BA/BS degree increased from 735 to 1,529 in 2018. This is an increase of 108%.

Table 1: NYC LSAMP History (Phase 1- 5) 1992 to 2018

Phase I 1992-1997
Expansion of the Alliance from 12 to 17 campuses; Established Learning Centers; Restructures Gatekeeper Courses in Math and Chemistry (PLTL model); Initiated NASA Collaborations.
Phase II 1997-2002
Institutionalized the LSAMP Central Office and Campus Activity Coordinators; Expanded the Research Assistantship Program (undergraduate and Graduate); Research Initiation Program and Research Articulation Programs; established the. Urban University Conference Series; established. NASA-Institute on Climate and Planets; and NASA Teacher Prep Program.
Phase III 2002-2007
Bridge To the Doctorate began; Bridge to Teaching Program; DOE-MOU/Brookhaven National Lab Partnerships.
Phase IV 2007-2012
Integrating Research Strategies (Course restructuring); CUNY Collaborations – College-Science and Technology Entry Programs, and the CUNY Black Male Initiatives; Bridge to the Doctorate Program ended.
Phase V 2012-2018
Undergraduate and a limited number of Graduate Research Assistantships, International Research Programs, Peer Mentoring, Professional Development Institute, Weekly Research Presentations, Global CUNY Conference. Ongoing Program Components - Collaborative Infrastructure, Institutionalized Workshop Instruction in Gatekeeper courses, Research Assistantships

Organization, Management and Sustainability

The management and leadership structures of the NYC LSAMP represented a cooperative effort of the participating institutions. The NYC LSAMP established several models and an operations manual that have been modified to reflect changes within CUNY and national priorities. It included a Management Chart, and the NYC LSAMP Campus Model, NYC LSAMP Governance Structure, Learning Center, Research Assistant and Activity Coordinator models. They served to guide the interactions and duties of the participants and core activities and promote a systemic comprehensive approach that supports the NYC LSAMP mission and goals.

The organization and management structure of the NYC LSAMP included:

- A Governing Board, chaired by the Chancellor
- A University-wide Steering Committee, chaired by the Principal Investigator/Project Director
- College-wide Campus Steering Committees, chaired by the respective Steering Committee Members and
- A University-wide Activity Coordinators Committee, chaired by the Project Administrator.

The Governing Board is chaired by the Chancellor of the City University, and consists of the Executive Vice Chancellor, the University Dean for Research, the Executive Director of the

[Type here]

Research Foundation, and CUNY College Presidents. The board met once each semester and received reports from the Project Directors, oversee general project operation, ensured that project objectives are being achieved, and provide direction and assistance in broadening the base of support for the Alliance among academic, industrial, and governmental sectors of society.

The Steering Committee consisted of one dean/provost from each of the seventeen CUNY partner colleges. This committee meets at least four times each semester with the Project Directors and will establish policy for the project. NYC LSAMP Steering Committee Members are presidential appointees of Alliance member campuses. Steering Committee members supervise/direct the Alliance program activities at their respective campuses. The *Campus Steering Committees* is chaired by the respective NYC LSAMP Steering Committee Members and meets on the respective campuses to provide executive direction to implement the Campus model.

The Campus Activity Coordinators meet monthly with the Project Administrator, to review the Research Assistants performances, campus operations, and plan and review operations to be carried out throughout CUNY.

Table 2: NYC LSAMP Activity Timeline

Activity	Phase I 1992-1997	Phase II 1997-2002	Phase III 2002-2007	Phase IV 2007-2012	Phase V 2012-2017
Restructuring Gatekeeper Courses in Math, Chemistry and Physics Collaborative Learning, Workshop Chemistry	x	(x)	(x)	(x)	(x)
Establishing/Augmenting STEM Learning Centers	x	(x)	(x)	(x)	(x)
Undergraduate Research Assistantships	x	x	x	x	x
Graduate Research Assistantships		x	x	x	x
Research Initiation and Articulation		x	(x)	(x)	(x)
Urban University Conference Series		x	x	x	x
Projectstem-Virtual Community		x	x	x	x
Bridge to the Doctorate Programming			x	x	x
International Research Programs				x	x
Integrated Research Strategies				x	x
NASA and DOE Partnerships	x	x	x	x	x
Entrepreneurial Activities					x
Preparing Future Faculty					x
(x) denotes institutionalization					

NYC LSAMP Research Assistantship Program

The NYC LSAMP Undergraduate and Graduate Research Program constituted a significant of the NYC Alliance. The program included - research experiences on or off CUNY campus, research enrichment and career development. Research Assistantships are offered during the

[Type here]

academic year and in summer. The NYC LSAMP CUNY Summer Research component draws on average participation from 30 NYC LSAMP Scholars each summer, with an additional 30-40 students obtaining internship opportunities at non-CUNY training sites. Over 100 CUNY faculty mentors participate in NYC LSAMP activities during any academic year. From inception, over 2,000 scholars (graduate and undergraduate) have been awarded scholarships by the NYC Alliance.

NYC LSAMP Activity Coordinator

Activity Coordinator positions at the participating NYC LSAMP campuses were institutionalized (beginning in 1997) as a significant component of the CUNY STEM pipeline. Activity Coordinators are graduate students in the STEM disciplines at CUNY. ACs have also served as Graduate Student Advisers (GSAs) for the NYC LSAMP Summer Research Program, designed and implemented a Professional Development Institute program for the LSAMP Scholars and assisted in accreditation, grant proposal writing and the Annual Campus Reports on the NYC LSAMP. With the creation of the International Education thrust, ACs have also served as site coordinators for the International Research programming in China (BUCT), Colombia (Uni Valle) [5].

Table 3: NYC LSAMP Activity Coordinator (AC) Outcomes

Activity Coordinator Outcomes	Number of ACs
Master's degrees	39
Completed the Doctoral degree at CUNY	23
Completed the Doctoral degree at a non-CUNY school	1
Currently doctoral candidate	7
Currently NON-CUNY doctoral candidate	1
Activities/Status currently unknown	11
Started the doctoral degree at CUNY and left the program	5
Faculty at CUNY (Full time and Adjunct)	19
Full time faculty at CUNY	4
Direct or Coordinate URM/UG research programs at CUNY	4
Higher Ed Administrators at CUNY	9

Of the 91 Activity Coordinators tracked, 23 successfully graduated with doctoral degrees from CUNY.

Major Outcomes of the Alliance Activity Coordinators include:

- 39 completing Master's degree
- 23 completing the Doctoral degree at CUNY
- 1 at completed the Doctoral degree at Stevens Institute of Technology
- 7 currently doctoral candidates
- 5 starting the doctoral degree at CUNY, and later left the programs
- 19 serve as faculty at CUNY (full time and Adjunct)
- 4 serve as full time faculty members at CUNY

[Type here]

- 4 Directing or coordinating URM/UG research programs
- 9 serving as Higher Education Administrators

Bridge To The Doctorate

The Bridge to the Doctorate (BTD) of the NYC LSAMP at CUNY had an objective to recruit and retain recent NYC LSAMP STEM graduates into a research/academic career that leads to the completion of a Ph.D. degree at CUNY or at other doctoral granting institutions. Nine cohorts of the BTD Scholars Cohorts 1-9 (2003 through 2015). (101 participants) were supported at CUNY. The objectives of the BTD program were to recruit and retain recent LSAMP STEM Graduates into a research/academic career that leads to the completion of a Ph.D. degree at CUNY or at other doctoral granting institutions. On average 50% (four of the seven campuses) go on to completing the doctoral degree (Tables 2 and 3).

Table 4: BTD School Of Origin and Doctoral Degree Completion

Master's College/University	Number	Doctoral /MD Recipients
City College	39	20
Lehman College	11	5
Brooklyn	9	2
College of Staten Island	7	4
Hunter College	6	2
Queens College	6	3
John Jay College	1	1

BTD scholars earned 79 master's degrees from the CUNY campuses, 40 earned doctoral degrees, 12 started the CUNY GC doctoral program and 7 left for industry. Currently 3 BTD scholars are still enrolled in doctoral degree programs at the CUNY GC.

- Forty (40%) Bridge to the Doctorate Scholars received the Ph.D. degree.
- Two (2%) received the MD degree.
- Sixty-five (64%) Bridge to the Doctorate Scholars have gained acceptances to Doctoral programs.
- Twenty-nine (45%) Bridge Scholars were accepted into doctoral programs at the CUNY Graduate Center.
- Thirty-six (55%) Bridge Scholars matriculated into Doctoral Programs outside of CUNY.
- Forty Bridge Scholars started their studies at a Community College or graduated from a Comprehensive College of CUNY.
- Twenty-one Bridge to the Doctorate Scholars started studies at a Community College.
- Thirteen (13%) Bridge Scholars received doctoral degrees from CUNY.
- Twenty-seven (27%) Bridge Scholars 27 received doctoral degrees from non-CUNY institutions.

[Type here]

Institutions in the states of New York, New Jersey and Connecticut accounted for 65% of the doctoral graduates. Engineering and the Biological Sciences accounted almost equally for 73% of all BTD doctoral recipients. A large number, 35%, graduated from the doctoral program at the CUNY Graduate Center.

Currently, 13 NYC LSAMP Graduate Assistants, BTB Scholars or Activity Coordinators are full time faculty members at CUNY. In total 23 are now serving the university in full time positions as in the classroom and as program directors and coordinators.

Vision LSAMP Survey

The NYC Alliance programming VISION NYC LSAMP, an initiative to incorporate the Alliance Alums in guiding the Alliance programming as we look to the future, as well as keeping the Alliance updated with their successes and career progression. VISION LSAMP seeks to engage alumni of the program in shaping the NYC Alliance activities in the upcoming years. Two VISIONLSAMP sessions were held in 2015 and 2016. An online survey was distributed to over 1900 LSAMP participants, in combination with developing an active LinkedIn social media plan.

The VISIONLSAMP survey was initiated in August 2018 and again in 2022 and received a response rate of 11% of the 1993 invitations in 2018, and 5% in 2022 (which is ongoing). Participants indicated that their range of start date at the NYC LSAMP which goes from Fall 1993 to Summer 2018, with more respondents having a start from 2014 to 2017 (Table 5). Of the VISION LSAMP 2018 survey respondents, New York is the home for 64%.

Table 5: VISIONLSAMP Survey 2018

Earning/Earned Degree	AS/AA	BS/BA	MS/MA	MB A	MD	Ph.D.	MD/Ph.D.	Other
Yes	70	204	101	7	7	51	1	28
No	156	22	125	219	219	175	225	198
Number of Degrees Earned								
	0	1	2	3	4	5	Total	
Frequency	4	67	83	54	16	2	226	
Number of Publications								
	1	2	3	4				
Yes	89	55	39	30				
No	137	171	187	196				
Currently Involved in Research								
Yes	87							
No	139							

[Type here]

Many NYC LSAMP Alums have continued to earn advanced degrees beyond the bachelor’s level at CUNY, regional universities and internationally (doctoral degree level included) [1]. The undergraduate and graduate research program were the heart of the NYC LSAMP. The program included - research experiences on or off CUNY campus, research enrichment and career development. Students were offered assistantships during the academic year and in summer. In addition, programs like the Bridge to the Doctorate program had the objective to recruit and retain recent LSAMP STEM graduates into a research/academic career that leads to the completion of a Ph.D. degree at CUNY or at other doctoral granting institutions. Post-doctoral training is prevalent in the Biological/Life sciences and less so in the Engineering disciplines, At CUNY and regionally LSAMP Alums are now on tenure track faculty position and are in senior leadership posts at the university level. As discussed earlier, LSAMP Alums are a significant presence at CUNY in both faculty and administrative roles.

Table 6: VISIONLSAMP 2022 Employment Role (ongoing)

Employment Title Designation	Number of Respondents
Engineer	29
Scientist	30
Consultant	4
Researcher	8
Managerial Level (Directors)	12
Faculty	14
C-Suite	6
Academic Administration	1
Instructors, Graduate students	3
Other	4

In Table 7 we list over forty companies that currently employ graduates of the program. The list shows a wide range of industries, company sizes and locations.

Table 7: Companies Employing LSAMP Alums (ongoing)

Company Name	Company Name
1. 24M Technologies Inc.	2. Kinetic Communities Consulting
3. AKRF, Inc.	4. Komodo Health
5. Argenx	6. Livent
7. Artera	8. Lynker Technologies
9. Bain and Company	10. Marlin Engineering
11. Bristol-Myers Squibb Company	12. Mastech Digital (Consultant for PNC bank)
13. Canon USA Inc.	14. Navigate Biopharma Services
15. Cisco Systems	16. Novo Nordisk
17. Corning Inc.	18. Ozen Engineering Inc
19. Corning Incorporated	20. Pall corporation
21. Energy Materials Corporation	22. PepsiCo

[Type here]

23. EpiVAX	24. Peraton Labs
25. EvolveImmune	26. Petal
27. Exponent	28. Pfizer
29. Ford Motor Company	30. Praxis Precision Medicines
31. Fullstack Academy	32. PTC Therapeutics
33. Gallagher Bassett Technical Services	34. Regeneron Pharmaceuticals, Inc.
35. General Motors	36. Sea Machines Robotics
37. Hamilton Company	38. Takeda
39. Hardesty and Hanover	40. Tempus labs
41. Instras Scientific LLC	42. Twenty Percent Plus
43. JP Morgan Chase	44. Wells Fargo

In Table 8, we illustrate the Agency and Academic sector employment of the graduates. Federal agencies, and New York state are the main beneficiary of the talents of the graduates.

Table 8: Agency, and Academic Sector Employment

Agency	13	13%
Agency Federal	9/13	(69%)
Industry	48	48%
Industry Sectors		TBD
Higher Education	26	26
Higher Ed in NY State	12/26	46%
CUNY	5	5%
Medical	9	9%
Medical in NY State	8/9	(89%)
NY State	29	29%

Recommendations from survey respondents could be related to the deficiencies they in the programming encountered during their stay in the program and are listed below. The credit option is one that comes up regularly as institutions/departments do not allow students to receive a stipend as well as academic credit.

- An option to work on my research with the professor as a credit option.
- Should include career fairs. There is a lot that the students can learn ahead of time before they get into industry to help them be more successful at their jobs and building a career.
- Perhaps, increasing/developing research opportunities that can be conducted virtually would open more STEM opportunities (research/internships/trainings) particularly for students who are parents and find it difficult to temporarily relocate during summers, and/or spend long nights at the campus on the regular basis.
- We need a community where we can connect with each other and support each other in our academic and professional ventures.
- Get the students to have industry/work experience.

[Type here]

Survey respondents ranked the program activities on a Likert scale (1-5). The top seven are shown in Table 9.

Table 9: Program Activity Rankings (ongoing)

Peer mentoring	3.21
LSAMP Pre-college program	3.64
Bridge to the Doctorate program	4.1
LSAMP campus Activity Coordinator	4.22
Graduate Research assistantship	4.25
Study Abroad/International Research	4.28
Undergraduate Research Assistantship/Senior college	4.78

A small sample of the sentiment expressed by survey respondents is shown below and represents the key features of the program, mentoring, research, and professional development.

- *Research experience and mentoring were essential for a successful time in graduate studies. Participation in the events even after graduation provided a sense of continuity and community. Honestly, participating in this program was one of the most consequential activities I undertook as an undergraduate student.*
- *I gained my first research experience through LSAMP undergraduate research program. That gave me solid preparation for doctoral studies. Moreover, the Bridge to Doctoral program further prepared me to obtain admission into a competitive PhD program.*
- *As a recently immigrated young engineer, NYC AMP was the best thing that happened to me, it opened all the doors to my professional future career providing me with the mentoring and support needed to learn and focus on my studies. I will always be thankful for the opportunity and the role that it played in my career.*
- *Provided me the opportunity to develop and explore science via academic research. I would not be the person I am today or be where I am today without the support, encouragement of the LSAMP advisors, and the exposure I was able to gain at the undergraduate level via this program. I was able to gain the tools to move on and thrive at the graduate level and eventually in the field of Biological Safety.*

Ongoing analysis is being conducted via LinkedIn to augment the VISIONLSAMP survey results assessing the career trajectories and mobility of the NYC LSAMP Alums, in educational attainment related to disciplines, campuses, program participation and educational institution ranking. Preliminary results from respondents show the influence of the International Research and the Bridge to the Doctorate program having a big impact on the career.

ACKNOWLEDGEMENTS

We acknowledge the support of the faculty and staff of the City University of New York in supporting the NYC LSAMP activities. We acknowledge the dedication and work of the faculty

[Type here]

mentors at CUNY and at the non-CUNY partner sites, as well as the Project Directors, Steering Committee and Activity Coordinators. We acknowledge the funding support of the NSF to the City University of New York and the NYC LSAMP.

References

- [1] Clewell, B.C., Cohen, C.C., Tsui, L., & Deterding., N. (2006). Revitalizing the Nation's Talent Pool in STEM. Washington, DC: The Urban Institute.
- [2] New York City Louis Stokes Alliance Annual Reports 1998-2011.
- [3] New York City Louis Stokes Alliance Impact Report 1992-2012 (2012).
- [4] New York City Louis Stokes Alliance Impact Report 1992-2015 (2012 and 2015).
- [5] Vernon, Julieanne., and Brathwaite, Claude., "Authentic International Research Experience: Program Model in Cartagena, Colombia" in the Proceedings of the 2016 ASEE Annual Conference, Paper ID # 15025, New Orleans, June 2016.