Georgia Tech | Parker H. Petit Institute for Bioengineering and Bioscience

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January 20, 2017

Center for Teaching and Learning
Georgia Institute of Technology
Suite 457, Clough Commons
266 Fourth Street, NW
Atlanta, Georgia 30332–0383

Dear Review Committee Members,

It is with great pleasure that I nominate my colleagues, Robert (Bob) Nerem and Manu Platt, for the Center for Teaching and Learning (CETL) Faculty Award for Academic Outreach. In 2012, these professors identified the critical need for underrepresented minority high school students to be exposed to higher-level, hands-on, academic research in the fields of biotechnology and engineering and sought purposefully to meet this need. As a result, in 2013, Project ENGAGES (Engaging New Generations at Georgia Tech through Engineering and Science) was created, and Bob and Manu have served diligently as co-directors since its inception.

Project ENGAGES is a high school science education program developed at Georgia Tech in partnership with Coretta Scott King Young Women's Leadership Academy, B.E.S.T Academy, KIPP Atlanta Collegiate, Benjamin E. Mays High School and Charles Drew Charter School – five minority-serving public high schools in the City of Atlanta. As part of this program there are two tracks: the Biotechnology Track and the Engineering Track. The first of these was established by the National Science Foundation (NSF) Science and Technology Center on the Emergent Behaviors of Integrated Cellular Systems, a center that is part of the Petit Institute for Bioengineering and Bioscience. The Engineering Track was established by several Georgia Tech entities, namely the Georgia Tech Research Institute, the School of Electrical and Computer Engineering, the George W. Woodruff School of Mechanical Engineering, and the NSF-funded Materials Research Science and Engineering Center.

The goals and milestones of this inspirational program are outlined in Bob and Manu's description so there is no need to also detail them here – though I must note they are impressive.

In addition to Bob and Manu envisioning these young scholars having the opportunity to do top-level research at Georgia Tech, they equally understood the importance of creating an atmosphere for the development of life skills. The scholars of Project ENGAGES participated in SAT/ACT prep courses, as well as professional development classes. Scholars toured various industry organizations and were hosted by a diverse group of

companies such as Kimberly-Clark, Axion BioSystems, and C.R. Bard. These experiences have helped to unveil the vast opportunities that await them during their college years and beyond.

To have Bob and Manu commit so much time and energy, in light of their research and administrative obligations, speaks not only to their high standards as it pertains to education, but also to their character as concerned citizens for the betterment and well-being of today's youth. Their belief in these scholars will continue and will have a positive impact in our world and society.

Because of this dedication, I, along with others here at the Petit Institute and across the city of Atlanta, am certain that Bob and Manu are deserving of this award as their sustained outreach contributions are representative of the vision and goals set forth by Georgia Tech. It is my pleasure to nominate Bob and Manu!

Sincerely,

Robert E. Guldberg, Ph.D.
The Petit Director's Chair in Bioengineering and Bioscience
Executive Director, Parker H. Petit Institute for Bioengineering and Bioscience
Professor, George W. Woodruff School of Mechanical Engineering

Georgia Tech Faculty Award for Academic Outreach Nomination

Manu Platt and Bob Nerem

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This nomination packet consists of:

Project ENGAGES (Engaging New Generations At Georgia Tech through Engineering and Science), is a high school science education program developed at Georgia Tech by EBICS (Emergent Behavior of Integrated Cellular Systems Center) in partnership with Coretta Scott King Young Women's Leadership Academy (CSKYWLA), B.E.S.T. Academy, KIPP Atlanta Collegiate, and most recently Benjamin E. Mays High School. The overall objective of this program is to engage underrepresented minority high school students in biotechnology by first training the group in a 4-week cell biology "bootcamp" jointly taught by high school teachers and Georgia Tech /EBICS students and staff. This bootcamp includes classroom instruction and hands on lab technique training. Then the students are matched with research labs and begin their 12-month research projects.

The main program goals are to:

- To inspire high school students who are underrepresented minorities to aspire to a life of wider possibilities including engineering and science
- To provide these students with the opportunity to actually do science
- Raise the awareness of students to the world of biotechnology through real-world, hands-on research projects led by top notch Georgia Tech scientists and to the career path possibilities in engineering and biology
- Provide the opportunity for these students to see people of their ethnicity being successful academically at a premier research institution, the Georgia Institute of Technology
- Provide students with perspective on how classroom academic learning relates to furthering scientific knowledge by hands-on experimentation to test hypotheses
- Improve the partner school's STEM education program through a teacher training initiative that allows teachers to also work side-by-side with a Georgia Tech faculty member in a research lab to gain skills and knowledge in new areas of science and engineering, and to develop a curriculum for use in the classroom

<u>ENGAGES Outcomes and Successes</u>

- 58 minority students completed at least one full year of research training
- 10 students in Year 1; 24 students in Year 2; 24 students in Year 3
- The enrollment of 18 new students in the fourth cohort that began in June 2016.
- In August 2016, a female student from CSKYWLA who is currently enrolled as a sophomore at Spelman College, was added to a research publication based on the work that was completed while she was an ENGAGES scholar

- Two students were selected to compete in the Intel International Science and Engineering Fair held in Philadelphia, PA Spring 2016
- 17 seniors graduated and started attending college in the fall of 2016, some of which include Georgia Tech, University of Michigan, Emory University, Spelman College, University of Pennsylvania, Wesleyan College, and Duke University
- Fifteen of the ENGAGES scholars advanced to State Science Fair
- The program had two Gates Millennium Scholar recipients in 2016
- Seven students from the third cohort are continuing for a second year. All seven will be seniors next year and among these, one is from CSKYWLA, one is from KIPP Atlanta Collegiate and five are from the BEST Academy
- One of the students from cohort one was selected to participate in the EBICS REU Summer Research Program and co-teach the ENGAGES bootcamp at Georgia Tech in 2016
- One student from cohort one was invited to return to Georgia Tech to assist the lab and facilities manager for another summer under the financial sponsorship of the institute
- Seven seniors were selected to attend the 2015 Annual Biomedical Research Conference for Minority Students (ABRCMS) conference in Seattle Washington. They were able to network and observe professional workshops, poster sessions, oral presentations and renown keynote speakers in action
- The ENGAGES students served on multiple panels in the spring and summer 2016 where they were able to talk about their research and experience to motivate their peers at neighboring schools to also pursue a career in STEM
- The program now has an official logo in addition to the website that was recently reconstructed (www.projectengage.gatech.edu) which houses information about the program, current student participants, and an alumni page which keeps a track of the program's alumni who have entered college

Please accept this statement of support for the nomination of **Dr. Bob Nerem and Dr. Manu Platt** for the Georgia Tech Academic Outreach Faculty Award. Our collaboration with both Dr. Nerem and Dr. Platt has been overwhelmingly positive. The benefits include:

- Productive academic outreach (Facilitators go beyond their normal duties to enrich the larger educational community with their subject matter knowledge)
- Raised awareness of students to the world of engineering, science and technology (Through real-world, hands-on research projects led by top notch Georgia Tech scientists)
- Exposure to career path possibilities in engineering and the sciences
- Social innovativeness (PE adds a complexity of high level interest and a model for secondary learning)
- Problem Solving Opportunities (Student participants solve problems of social importance)
- Improvement in the schools' science education program (through direct interaction with the science classes and through a teacher training initiatives)
- Teacher development (The full immersion of teachers in ongoing research within Georgia Tech's laboratories)
- The formation of the Project ENGAGES Day and STARs Science Club to maintain the active interests of future program participants in varies venues and with multiple student groups.
- The Project ENGAGES (PE) Program advances the academic discovery and understanding of student participants by exposing them to research practices and allowing them to conduct
- A-grade research with the proper tools and resources (both human and material) while promoting and providing excellent mentor based training and solid rigorous learning.

The benefits of (PE) are numerous but the overarching significance of PE is the research. The real possibility exist that a student's research idea could have societal or even global implications. 100% of the student participants have graduated and attended college; two at Georgia Tech. Students agree that the multiplicity of experiences provided by PE have made a significant impact on their lives, both in and beyond the classroom.

The reach of PE extends well beyond the Georgia Tech classroom and laboratory it touches their homes, it provides financial support, creates a more responsible and task oriented student, it helps them to build character and experience life beyond the school. It has become the torch that ignites and guides their futures paths.

We are fortunate to have the leadership and guidance of both Dr. Nerem and Dr. Platt. It is rare to have such synergy among colleagues. Their leadership is the glue that fosters and sustains PE's success but more importantly it guarantees the success of students. The both expertly facilitate the development, communication, implementation, and evaluation of a shared vision of teaching and learning that leads to student improvement and academic growth. Their deep sense of commitment, drive and incredible work ethic guarantee our students no small measure of success in whatever endeavor they choose. They are truly difference makers!

Thanking you in advance for your recognition of such a worthy applicants.

Sincerely,

Dr. Timothy D. Jones, Principal, B.E.S.T. Academy (6-12)

To Whom It May Concern,

Project ENGAGES is an amazing concept and the experience afforded the students is unmatched. It provides them an immediate chance at this very early time in their lives to see how THEIR very own thoughts and ideas (not someone else's) can impact their families, communities, nation and the world. Furthermore, students learn how to work with others, time management, presentation skills, and how to network ... all items that will serve them well in the future.

Over the past three years, I've seen young people grow from nervous, unsure high school students to confident, thought provoking young adults. The research they assist with is top notch and may lead to the next groundbreaking advancement in medicine or engineering. For me, the most important aspect about the program is that it provides an opportunity ... an opportunity for young African American students to test themselves and reaffirm that 'Yes' I can do this and 'Yes' I have the abilities to become whatever it is I decide to be.

Drs. Nerem and Platt are really exceptional people both in their interactions with and guidance of the students. I truly believe that their vision of an ENGAGES student and influence is exemplified in every graduate of the program. It truly is their destiny to be the driving forces behind Project ENGAGES and their dedication is greatly appreciated. It's because of people like Bob and Manu and programs like Project ENGAGES that Tech is one of the best universities in the world.
Regards
Wilbert Tremble, Georgia Tech Black Alumni Organization President, GT IE 90, MSIE 91

To whom it may concern:
It is with great pleasure that I write this nomination letter on behalf of Dr. Manu Platt, recognizing a faculty member for their achievement in Academic Outreach.
I had the pleasure of meeting Dr. Platt four years ago as he was facilitating a lab specifically designed for Biotechnology Teachers. His presentation was thought provoking and relevant to real world application. His workshop was on the cusps of the NCAA decision requiring all of its athletes to be tested for sickle cell anemia.
Upon my return to class, I was able to share this information with my students. My students were able to relate to the information due to the fact that many of them had family members with sickle cell, had the trait themselves or were athletes that had aspirations to play sports on the post-secondary level.
I was elated when Project ENGAGES extended its invitation to more Atlanta Public Schools. Project ENGAGES offer students the opportunity to build their knowledge of biotechnology by working alongside a mentor (a graduate student) assisting them with ongoing research in their lab.
Project ENGAGES, not only offers our students an opportunity to work in a lab setting, it guides our minority students through the college admission process by offering college prep classes, financial aid assistance, and a first semester forum which includes a panel discussion with recent graduates of Project ENGAGES. This forum allows current students in Project ENGAGES the opportunity to speak openly with students that have completed their first semester of college.
Project ENGAGES prepares students for real life by offering them financial assistance with their paychecks, presentation preparation and soft skill building by allowing them to work with other students and individuals that they normally would not engage with.
Dr. Platt is an amazing individual that saw fit to create an organization that gives minority students the opportunity to work in a scientific laboratory completing research that will impact the well-being of the future.
He has my full recommendation as a nominee for the Faculty Award in Academic Achievement.
Sincerely,
Dr. Tonya A. Walker, MATH & SCIENCE ACADEMY, Benjamin E. Mays High School, Atlanta Public Schools

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To Whom It May Concern,
I am pleased to write this letter nominating Dr. Robert Nerem for the Faculty Award in Academic Outreach.
Dr. Nerem, has given our students an opportunity to experience life as a scientist.
Students are experiencing the scientific circle first through the lens of a high school student taking science classes which then, through Project ENGAGES evolves into a student intern working in a college lab setting under the mentorship of a graduate student and ultimately transforming that experience into a career that will impart major discoveries in the field of science.
Dr. Nerem and Project ENGAGES allows our students in Atlanta Public Schools a firsthand experience in the area of scientific research and discovery that is often times overlooked. Students are given the opportunity to become involved in an area of exploration through ongoing experimentation, scientific presentations and site visits to biotechnology companies that are located in Atlanta, Georgia or surrounding areas.
This experience allows our students to truly appreciate the work of a scientist.
Dr. Robert Nerem has my full recommendation as a nominee for the Faculty Award in Academic Outreach.
Sincerely,
Dr. Tonya A. Walker, MATH & SCIENCE ACADEMY, Benjamin E. Mays High School, Atlanta Public Schools

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It gives me great pleasure to nominate Drs. Robert M. Nerem and Manu O. Platt for the 2017 CETL faculty award for their outstanding work with Project ENGAGES (Engaging New Generations at Georgia Tech through Engineering and Science. Project ENGAGES addresses an important need in our community: diversity, inclusion and exposure to STEM fields. Since its inception in 2012, Project ENGAGES has not only exposed high school students to real life research experiences but it has also changed the economic trajectory of many families through the vision of Drs. Nerem and Platt. Project ENGAGES is an exceptional program because it impacts the scholars by giving them exposure to research and allows them to gain admission into top universities. It Impacts the ENGAGES Mentors by allowing them to obtain hands on learning how to train students in the research laboratory thereby honing their interpersonal and leadership skills. It impacts the Atlanta Public schools by enabling Georgia Tech to not only bring ENGAGES scholars to the campus but it also exposes other students in the schools to experience science, engineering and technology through high speed video conferencing sessions and hands on science clubs organized and led by the GT Bioengineering and Bioscience Unified Graduate Students (BBUGS). Teachers are also able to get training, acquire laboratory skills at Georgia Tech and co teach the summer course in Cell Biology. Finally Project ENGAGES benefits the Georgia Tech Community at large by generating positive media attention toward Georgia Tech from radio stations like National Public Radio. They hosted a series of stories on Project ENGAGES. Through Bob and Manu's leadership, Project ENGAGES received the 2013 Georgia Tech Diversity Champion Award sponsored by the Office for Institute Diversity.
Project ENGAGES Leadership:
Dr. Manu Platt has a passion for encouraging students to do their best and take advantage of the experiences afforded to them. He sets a great example of how inclusiveness and diversity can enhance the STEM field here at Georgia Tech and abroad. He has been instrumental in working with teachers, program managers, and students in developing the curriculum for the program over the years. Manu has certainly developed as a leading scientist from his undergraduate days in the lab coming from Morehouse to GT to do research to serving as an overall champion for inclusiveness and diversity on the GT campus and the greater Atlanta area. Dr. Bob Nerem leverages his global influence in both the academic and industrial world to provide unique learning experiences for all students. Over the past 23

years that I have known and highly respected Bob, he has always valued diversity and inclusion. His tireless ability and facility to bring a diverse team (school system, university, private sector, and community) together for Project ENGAGES and develop a winning program is unparalleled. Bob's STEM efforts continue to give rise to a variety of scholars and mentors that differentiate into fantastic graduate students, scientists, clinicians and engineers. As a result, they are well prepared to face the challenges that the future holds.

On a personal note, Project ENGAGES has had a positive impact on my daughter who participated in the program in 2013 and 2014. Project ENGAGES helped her realize her own potential and develop some of the desirable soft skills such as effective communications and networking, patience, preparation for the SAT/ACT and exposure to research. In fact, the SAT/ACT prep enabled Jasmine to significantly increase her scores. As a result of participating in Project ENGAGES, she was able to secure a partial scholarship to Howard University in 2014 and she is on track to graduate in 2018.

In summary, I can say with full confidence and boldness that Drs. Nerem and Platt are most deserving of this award. Their contributions to promoting STEM, creating and sustaining diversity and inclusion, and transforming lives and communities through Project ENGAGES is unparalleled. It is with great honor, pride and pleasure that I nominate them for the 2017 CETL award!

Sincerely,

Steven I. Woodard, Assistant Director, Core Facilities

Petit Institute for Bioengineering and Bioscience, Georgia Institute of Technology

and enthusiastic Project ENGAGES advocate!

Project Engages is a great program that stirs interest in careers and studies in the STEM fields. When I was in Project Engages, although I was on the engineering track, I still learned a variety of topics from coding java and computer architecture to the role of stem cells in the human body. Project Engages has also shown me that I am very capable of presenting research on a subject I was once confused about myself, and it motivated me to see my peers also presenting research in depth. I learned about having confidence in my work, how to behave in the research/workplace environment, and how to continue to do my best so that I can have another research opportunity in the future. I was a scholar in Project Engages from 2015-2016 and I graduated from KIPP: Atlanta Collegiate. Now, I attend Georgia Tech.

Jalyn N. Gordon

My name is Alexus Clark a graduate of Coretta Scott King Young Women's Leadership Academy and a second cohort Project ENGAGES alumnus. I am currently a freshman at The Georgia Institute of Technology and thanks to the generosity of Dr. Nerem and Dr. Platt my once in a lifetime internship in the Wallace H. Coulter Biomedical Engineering department was a reality. As a Project ENGAGES scholar, I have been given a platform that many of my peers can only dream of having and this opportunity has shaped my lifelong goals of being in the STEM field and to ultimately share my knowledge to people in communities like mine. Along with providing us with this opportunity Dr. Nerem and Dr. Platt have been mentors to me personally. Dr. Nerem always had his door open when I checked in for the day and asked me how I was doing. Dr. Platt reached out when he wasn't traveling the world and assisted with science fair projects, college applications, and my overall academic and personal growth. They both were there for the major and minor things and always was open to talking with us all. As a freshman at Georgia Tech, I am proud to be an alumnus and I look forward to the continued growth of the Project ENGAGES program.

Project ENGAGES is exceptional for more reasons than one can name. Project ENGAGES takes students who can only imagine what science and engineering is and makes it a reality while simultaneously creating a culture of outstanding mentorship.
The program masters many aspects of the high school to college transition, including college and scholarship essays and AP, SAT and ACT test prep. Even more importantly, the network and community they provide for us is admirable.
Personally, Project ENGAGES helped me pass my Biology AP exam, increased my ACT score and helped me get over $1 million in scholarships. I not only have 3 full rides to GT, but I also have a home away from home with the Platt lab and all of Project ENGAGES.
I honestly believe and can attest that there will never be a time when a current or past Project ENGAGES scholar will not have guidance for anything that high school, college, or life can throw at us.
Katrina Burch
Project ENGAGES scholar from 2013-2015
Attended Coretta Scott King Young Women's Leadership Academy High School
Currently attending Georgia Tech in Industrial and Systems Engineering

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My experience with the Project ENGAGES program has greatly impacted my life and I am grateful to have had the opportunity to participate in such an amazing program. I not only gained invaluable laboratory experience and learned techniques for obtaining future research positions, but also learned professional skills that I can use throughout my career. The research experience I acquired has given me an intellectual advantage in my coursework and education. Performing research and attending the educational workshops and seminars helped me become more organized and precise in the way I study, take notes, and engage in conversation. In addition to the research experience, the financial support offered by the program and wonderful mentoring from faculty and staff has made it easier to adapt to my college campus experience. This training not only prepared me to pursue a course of study in science, but has also helped me confirm my career path in the medical field. Thank you to Dr. Nerem and Dr. Platt for having the vision and foresight to create an avenue for high school students to gain valuable research and professional skills that they can use throughout life. I encourage everyone who has the opportunity to take advantage of this innovative research program.
Kristen Kelley
Wesleyan College, Class of '20

Although I have had the opportunity to partake in hands-on research through Project ENGAGES, I have learned much more than information about science. While employed at Georgia Tech through the Project ENGAGES, I have gathered valuable knowledge about teamwork in the workplace, diversity, and building a strong network. More importantly I have developed a better understanding of the different science and engineering careers. I have been encouraged to be unconventional and innovative in many ways that will be useful in S.T.E.M. fields. Lastly, I have developed a deeper appreciation for science and for what it means to be a part of life changing research. This opportunity has encouraged me to explore many of my untapped scientific interest. Project ENAGES has left me with an unforgettable experience and endless possibilities.
Thank you and have a wonderful day!
Nicole Gullatt
Emory University

Dr. Nerem and Platt remind me of the classic superheroes Mermaid Man and Barnacle in the modern "SpongeBob SquarePants" television series. Both are willing to help the future generation make their

dreams into reality and put a smile on their parents/guardians faces. By doing so, they started Project Engages who gave nearby public school students a unique opportunity to conduct cutting-edge research at the highly ranked Georgia Teach. More importantly, they invested their time, money, and educational supports to their members to assure they conquer future obstacles. Their efforts generate love for the science subject and coerce the members to excel in their academics because they are excited to see what happens next. Besides enriching the members of Project Engages's academically, they physically show them the places where science can guide them if they are devoted. The EBICS among all of the other cool places we visited was an eye opener for me about to the science community. The EBICS affiliates talked about the science pipeline and where students tend to become uninterested in science. Project Engages will help fill the voids in the pipeline and increase the science community statistics several folds.
Kendreze Holland
Georgia State

A wise woman once said, "The greatest and most powerful revolutions often start very quietly, hidden in the shadows. Remember that." This quote somewhat represents my feeling towards the hidden gem that was placed in my community: Project ENGAGEs. As I reflect upon my time as a participant of Project ENGAGEs, I consider the cofounders of project ENGAGEs to be revolutionaries. Dr. Nerem and Dr. Platt are two honorable men that challenged the paradigm and allocated their focus and efforts towards underrepresented minorities and communities. I am proud to be a member of the inaugural Project ENGAGEs class. Before entering Project ENGAGEs, I only thought that I liked science, because I was good at it. When I entered Project ENGAGEs, I developed a passion for science and research that bolstered my knack for STEM and boosted my trajectory both academically and professionally. Project ENGAGEs did not only present me with the opportunity to do research on tissue regeneration and vascular remodeling, but it presented me with mentors who assisted me in the everyday journey beyond the laboratory. If it was not for Project ENGAGEs, I would not be at Stanford University today. This program is so important, because it levels the playing field. It gives at-risk young men and women from deprived neighborhoods such as myself an outlet to changing the world. When I figured out that my research project at ENGAGEs could be used towards developing three potential therapies for solving atherosclerosis, I was astonished. Due to my research through Project ENGAGEs, I was able to travel to Los Angeles and Pittsburgh to compete in the International Science and Engineering Fair for two consecutive years. This program is a catalyst for world class competitors. Project ENGAGEs afforded me an opportunity that most of my Stanford peers have not received yet. With that being said, if anyone deserves to win the award for academic outreach, Dr. Nerem and Dr. Platt should definitely be at the forefront. I am a proud example of what Project ENGAGEs can produce, and it would not be possible without the efforts of the pioneers themselves: Dr. Robert Nerem and Dr. Manu Platt.
Much love and gratitude,
Amadou Bah