

CURRICULUM VITAE

Dr. Gabriel R. Burks, PhD

Department of Bioengineering
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EDUCATION

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| <p>Drexel University Doctor of Philosophy “Poly (Vinylidene Fluoride): Crystalline Structure, Morphology and Conversion to Exotic Carbon Nanomaterials” Advisor: Prof. Christopher Y. Li</p> <p>Drexel University Master of Science Major: Materials Science & Engineering</p> <p>Grambling State University Bachelor of Science Major: Physics Major Concentration: Material Science Minor: Chemistry</p> | <p>2018</p> <p>2017</p> <p>2011</p> |
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AWARDS

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| <p>Drexel University Young Alumni Distinguished Service Award Carl Storm Underrepresented Minority Fellowship for Gordon Research Conference Drexel University College of Engineering Commencement Speaker NSF ACADEME Summer Workshop NSF Revolutionizing Engineering and Computer Science Departments (NSF-RED) Postdoctoral Fellow Drexel Materials Science & Engineering Outstanding Graduate Student Award Alpha Sigma Mu (ΑΣΜ) National Materials Science & Engineering Honor Society Drexel University/Chappell-Culpeper Foundation Graduate STEM and Curriculum Development Fellow Koerner Family Fellowship Drexel University Graduate Student Association Best Event: “The Fry” Cookout to advance graduate degree attainment Drexel University Engineering Teaching Fellowship 1st Place TAFDV Student Poster Competition @ University of Pennsylvania Drexel University Graduate Student Association Graduate Spirit Award Society of Plastic Engineers-Philadelphia Chapter Membership Fee Sponsorship 2nd Place Graduate Student Oral Presentation Competition 16th Annual Philadelphia AMP Research Symposium and Mentoring Conference @ Philadelphia, PA National Science Foundation Drexel University GK-12 Fellowship (NSF-GK12) Department of Education Graduate Assistance in Areas of National Need Drexel Research and Education in Advanced Materials Fellowship (GAANN-DREAM) HBCU STEM Fellowship, Educational Advancement Alliance Sigma Pi Sigma (ΣΠΣ) National Physics Honor Society Center for Achievement in Mathematics, Science, and Technology (CMAST) Scholar & Group Leader LS-LAMP Level II Cadet Scholar</p> | <p>2020 2019 2018 2018 2018 – present 2017 2017 2017 2017 – 2018 2016 2016 – 2017 2015 2014 2014 – 2018 2013 2013 – 2016 2012 – 2013 2011 – 2012 2008 2007 – 2010 2007 – 2008</p> |
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TEACHING EXPERIENCE

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| <p>University of Illinois Urbana-Champaign Guest Lecturer – BIOE 210 Conservation Principles of Bioengineering Guest instructor periodically during a given semester</p> <p>Course Advisor – ENGR 198 Engineering Ambassadors</p> <p>Occasional lecture and constant advisor to students. Illinois Engineering Ambassadors is a professional outreach program sponsored by the Office of Undergraduate Programs in the College of Engineering. Our ambassadors serve as role models of engineering to those who are classically underrepresented and underserved in engineering fields. (http://ambassadors.engr.illinois.edu/)</p> <p>Drexel University Co-Developer & Instructor – ENGR 103 Design a STEM Lab...An Engineering Education Approach Co-developed syllabus and overall course structure, including weekly labs, and input all grades. This course was the first of its kind, where we formally introduced engineering design students to K-12 STEM education through the design of age and level appropriate education tools to complement a specific STEM topical area lesson.</p> <p>Co-Instructor – ENGR 101, ENGR 102, & ENGR 103 Engineering Design Lab I, II, & III</p> | <p>2018 - 2020</p> <p>2018 - present</p> <p>2017</p> <p>2016 -2017</p> |
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Co-instructed engineering design lab with a full-time professor. Handled lecture, grading, and grade input into banner system.

Grambling State University

Teaching Assistant – to Professor Naidu Seetala in Physic 112

2010

Delivered some lectures, graded exams, and led study session with students following exams.

RELATED EXPERIENCE

University of Illinois Urbana-Champaign

Postdoctoral Research Associate

2020 – Present

As a postdoc in the Materials Science & Engineering Department on an NSF-MURI Grant at UIUC, I work with Professor Charles Schroeder on various research objectives pertaining to the biomimicry of leafhopper nanostructures.

Frost Defense Envirotech Inc. (<https://frostdefense.com>)

Vice-President & Head of R&D/Senior Polymer Formulation Scientist

2018 – Present

Consult and lead on formulation for polymer encapsulation technology. Heavily involved in the quality control of grant proposals, determination of research directions, and leading start-up team to accomplish broader company goals.

University of Illinois Urbana-Champaign

Postdoctoral Research Associate

2018 – 2020

As a postdoc for the NSF-RED Grant at UIUC, I was responsible for maintaining progress in research directions pertaining to the assessment of undergraduate learning. I was able to obtain significant experience and training in formal engineering education research and research methods. Lastly, I served as the lead for several research directions, obtained significant grant writing experience, served on university committees, developed new university collaborations, mentored doctoral students, and published manuscripts.

Drexel University/Chappell-Culpeper Foundation

STEM and Curriculum Development Fellow

2017 - 2018

Through this partnership with Drexel University and Chappell-Culpeper Foundation, I was responsible for training doctoral students in STEM curriculum development for the Colonial School District in Pennsylvania.

Drexel University Soft Matter Research Group

Laboratory Safety Manager

2013 - 2016

As the lab safety manager, I was responsible for ensuring that all chemical were store and disposed properly, managing laboratory audits, regulating laboratory personal protection equipment, safety training, and establishing safety standard operating procedures for the research group.

Several University Sites

Summer Research Assistant

2007 - 2011

Every summer from 2007 to 2011, I conducted STEM research at institutions outside of my home institution. Those sites included: Tulane University, Fisk University, University of Delaware, and Rice University. The research areas were: water in oil emulsions, photon upconversion in doped glass ceramics, carbon sequestration, and conductive polyethylene nanocomposites, respectively.

PUBLICATIONS AND PAPERS

1. *“Impact of Ethics and Social Awareness Curriculum on the Engineering Identity Formation of High School Girls”*
Burks, G.R.; Amos, J.R. Educ. Sci. 2019, 9, 250.

2019

2. *“Embedded Tagging and Radar Map Shape Analysis for Assessing Student Outcome”*

GR Burks, CW Castleberry, & JR Amos (2019, June)

Paper presented at 2019 ASEE Annual Conference & Exposition, Tampa, Florida.

2019

3. *“Leveraging Undergraduate Curriculum Reform to Impact Graduate Education: A Case Study”*

Amos, J. R., & Herman, G. L., & Pool, M., & Cross, K. J., & Insana, M. F., & Burks, G. R. (2019, June), Board 4: Paper presented at 2019 ASEE Annual Conference & Exposition, Tampa, Florida. <https://peer.asee.org/32341>

2019

4. *“Poly (Vinylidene Fluoride): Crystalline Structure, Morphology, and Conversion to Exotic Carbon Nanomaterials.”*

GR Burks, Drexel University (Dissertation)

2018

5. *“Great Ideas for Teaching Students (GIFTS): Developing Students through a “Design a Lab” Exercise”*

Marino, R. J., & Burks, G. R., & VanKouwenberg, M. N., & Terranova, B. B. (2018, July), Paper presented at 2018 FYEE Conference, Glassboro, New Jersey. <https://peer.asee.org/31418>

2018

6. **"Structure and Morphology of Poly (vinylidene fluoride) Nanoscrolls"**
GR Burks, Hao Qi, Sarah E. Gleeson, Shan Mei, and Christopher Y. Li, *ACS Macro Letters*, **7**(1), 75-79. 2017
7. **"Mapping PVDF Crystalline Morphology,"**
GR Burks, H. Qi, SE Gleeson, S. Mei, and CY. Li, In *Abstracts of Papers of the American Chemical Society* (Vol. 252) 2016
8. **"Reinforcing Learning Concepts via Engineering Lesson Planning"**
Ward, J. S., & Fontecchio, A. K., & Shultz, R., & Burks, G. R. (2015, June), *Paper presented at 2015 ASEE Workshop on K-12 Engineering Education, Seattle, Washington.* <https://peer.asee.org/17116> 2015
9. **"Positron Lifetime Analysis of Polyurea-Nanoclay Composites."**
Naidu V. Seetala, GR Burks, Danny Hubbard, Alex Trochez, and Valery N. Khabashesku. *Supplemental Proceedings: Materials Processing and Interfaces*, Volume 1 (ed TMS) 2012
10. **"Physical Properties of Aliphatic and Aromatic Polyurea-Nanoclay Composites"**
Naidu V. Seetala, GR Burks, D. Hubbard, A. Trochez, and V. N. Khabashesku, *ACS Polymer Materials Science and Engineering Division Preprints* 2011

RESEARCH GRANTS AND FUNDING SOURCES

- NSF 19-554 SBIR Phase I: Budbreak Delay Gel Technology for Frost Management and Mechanization of Vineyards**
AMOUNT: \$250,000 (FUNDED) 2019/2020
- Social and Behavioral Sciences Research Initiative (CSBS) Small Grant, "Developing Conjoint STEM-SEL Educator Consultation Models"
- AMOUNT: \$20,000 (NOT FUNDED)** 2019
- Discovery Partners Institute (DPI), "Expanding STEM Career and Occupational Opportunities for Black Male Students Who Play Sports"
- AMOUNT: \$15,000 (NOT FUNDED)** 2019
- Philadelphia Public School Giving Circle (PPSGC), "STEM Enhancement Grant for Alain Locke School in West Philadelphia"**
AMOUNT: \$500 (FUNDED) 2017

MEMBERSHIPS

American Chemical Society (ACS)
American Physical Society (APS)
American Society for Engineering Education (ASEE)
Kappa Alpha Psi Fraternity Inc.
Society of Plastic Engineers (SPE)

SELECTED ACCOMPLISHMENTS

Founder of "Millennial Talk," a series of conversations dedicated to improving millennial financial awareness at N. Philadelphia barber shop
Founder of Triskeles High School Art Showcase and Auction in Philadelphia
Founder of "The Fry," a social cookout dedicated to higher education advocacy, community engagement, and support of local business
Founder of "Educate The SWAG" website, dedicated to increasing community awareness of issues and pathways to higher education

CONFERENCES AND PRESENTATIONS

2020

American Society for Engineering Education (ASEE) @ Montreal, Quebec June 2020 **Workshop Host** "Multi-Level Curriculum Assessment using Gradescope"

2019

Gordon Research Symposium (GRS) & Conference (GRC) Polymer Chemistry **Presenter** 2019
American Society for Engineering Education (ASEE) @ Tampa, FL June 2019 **Session Moderator and Presenter**

2018

Philadelphia Alliance for Minority Participation (AMP) Research Symposium and Mentoring Conference **Keynote Speaker (invited)**
Kappa Alpha Psi Fraternity Inc. North Central Province Undergraduate Leadership Summit Graduate School Panelist @ Chicago, IL **(invited)**
UIUC Bioengineering GAMES Camp Co-Organizer and Facilitator
American Society for Engineering Education (ASEE) @ Salt Lake City, UT June 2018
Drexel University College of Engineering **Commencement Speaker (invited)**

2017

"Conversations on Grit and Mental Toughness" **(invited)** Motivational talk for the Drexel University College of Business Nov 2017
5th Annual Black Doctoral Network Conference Attendee @ Atlanta, GA Oct 2017
Drexel DELTA Summer Pre-Freshman Summer Program Instructor at Drexel University Aug 2017

2016

Guest Speaker (invited) at Breakthrough of Greater Philadelphia @ Friends School Dec 2016
Men of Honor Panelist **(invited)** for the 18th Annual Philadelphia AMP Research Symposium and Mentoring Conference @ Philadelphia, PA Oct 2016

Oral Presenter for the American Chemical Society (ACS) Conference @ Philadelphia, PA Aug 2016
Oral Presenter for the American Physical Society (APS) Conference @ Baltimore, Maryland Mar 2016
Guest Instructor (**invited**) at Breakthrough of Greater Philadelphia @ Drexel University April 2016
Workshop Guest Speaker (**invited**) for the 17th Annual Philadelphia AMP Research Symposium and Mentoring Conference @ Philadelphia, PA

2015

Poster Presenter for the Thermal Analysis Forum of Delaware Valley @ University of Pennsylvania Dec 2015
Workshop Presenter at American Society for Engineering Education (ASEE) @ Seattle, WA June 2015

Graduate Student Oral Presenter for the 2015 NOBCChE Conference @ University of Pennsylvania
Guest Lecturer (**invited**) at Johns Hopkins University Science and Technology Day @ Drexel University May 2015

2014

Guest Lecturer (**invited**) of Science & Engineering at TeenSHARP, Inc. (Greater Philadelphia Region) July 2014
Keynote Speaker (**invited**) at Johns Hopkins University Science and Technology Day @ Drexel University June 2014

2013

Graduate Student Oral Presentation for the 16th Annual Philadelphia AMP Research Symposium and Mentoring Conference @ Philadelphia, PA
Undergraduate Poster Competition Judge for the 16th Annual Philadelphia AMP Research Symposium and Mentoring Conference @ Philadelphia, PA

2012

Fellow of the 2012 Fattah Conference on Higher Education @Philadelphia, Pennsylvania

2011

Attendee of the Thermal Analysis Forum of Delaware Valley @ University of Pennsylvania
2011 University of Louisiana System Research Day Competition Oral Presenter @ Natchitoches, LA
2011 Emerging Researchers National Conference in STEM Oral Presenter @ Washington D.C.
Attendee of the 2011 Fattah Conference on Higher Education @Philadelphia, Pennsylvania

2010

Rice University/University of Houston AGEP Closing Banquet Poster Presenter, "Polymer Crystallization in Single-Walled Carbon Nanotube/Medium-Density Polyethylene Composites" @Houston, Texas
18th Annual Phillip L. Young Research Symposium Oral Presenter @ Grambling, Louisiana, "Positron and magnetization studies of polyurea-nanoclay composites"
2010 Minority Leaders Spring Review Conference Oral Presenter @ Dayton, Ohio, "Characterization of Polyurea-Nonoclay Composites; B4C and Al2O3 Body Armor Materials"
2010 Louisiana Academy of Sciences Conference Poster Presenter @ Alexandria, Louisiana, "Positron lifetime studies of sintered B4C pellets"

2009

HBCU-UP 2009 Research Symposium @ Washington D.C. Poster Presenter, "Positron Lifetime Studies of Polyurea-Nanoclay Components"
2009 17th Annual Phillip L. Young Research Symposium Oral Presenter, "Positron source calibration and positron lifetime spectra for Si and B4C"
Attendee of the 2009 Fattah Conference on Higher Education @ Philadelphia, Pennsylvania

2008

Attendee of the 2008 Louisiana Academy of Sciences Conference @ Natchitoches, Louisiana
2008 16th Annual Phillip L. Young Research Symposium Oral Presenter, "SEM and Magnetic Studies of Polyurea-CNT Composites"
HBCU-UP 2008 Research Symposium @ Atlanta, Georgia Poster Presenter, "SEM and Magnetic Studies of Polyurea-CNT Composites"
2008 University of Florida Campus Visitation Program

2007

Attendee of the LS-AMP MGE@MSA/WAESO Conference 2007 @ Arizona State University

OUTREACH**2020**

UIUC Bioengineering Engineers Aiming for Gender Equity and Representation (BioE-EAGER) 9-11th Grade **Summer Camp Organizer and Facilitator**
UIUC Bioengineering Inclusion, Diversity, Equity, and Access (BioE-IDEA) 9-11th Grade **Summer Camp Organizer and Facilitator**

2019

UIUC Bioengineering GAMES **Camp Organizer and Facilitator**

2018

Chicago ICANEXSEL **Camp Instructor** @ UIUC
University of Illinois Department of Bioengineering GAMES **Camp Co-Organizer**
Alain Locke School STEM Enhancement Grant and Development of Cardboard Robotics Curriculum
Southwest Philadelphia District Services, Community RCO
Alain Locke School-School Advisory Council (SAC)

2017

Science Lecturer at TeenSHARP, Inc. (Greater Philadelphia Region)
Greater Exodus Baptist Church Black History Month Professional Panelist
STEM Diversity Day Professional at Community College of Philadelphia
Millennial Talk Series: Conversations Around Millennial Financial Awareness at Barber on Broad Barbershop Founder
Southwest Philadelphia District Services, Community RCO
Triskeles High School **Art Showcase and Auction Founder**
"The Fry" Founder and Organizer: Higher Education Advocacy, Community Engagement, and Social
Alain Locke School-School Advisory Council (SAC)

2016

Drexel University Materials Science & Engineering Department Materials Camp Demo Leader: June 2016
Drexel University Materials Science & Engineering Department Two-Day Course Demo Leader: September 2016
Science Lecturer at TeenSHARP, Inc. (Greater Philadelphia Region)

Love and Enterprise in the Black Community Organizer through the Drexel Dornsife Center

"The Fry" Founder and Organizer: Higher Education Advocacy, Community Engagement, and Social

2015

Drexel University Materials Science & Engineering Department Two-Day Course Demo Leader: June 2015

Annual Philly Materials Day 2015 Demo Leader: February 2015

"The Fry" Founder and Organizer: Higher Education Advocacy, Community Engagement, and Social

2014

Science Lecturer on Cyberspace Security & Experimental Demonstrations at TeenSHARP, Inc. (Greater Philadelphia Region)

Drexel University Materials Science & Engineering Department Two-Day Course Demo Leader: June 2014

Annual Philly Materials Day 2014 Demo Leader: February 2014

Harambee Institute Science Demo Instructor: October 2014

"The Fry" Founder and Organizer: Higher Education Advocacy, Community Engagement, and Social

2013

Annual Philly Materials Day 2013 Demo Leader: February 2013 - Conducted polymer slime demos for all in attendance. Event hosted over 1000 visitors.

2012

Ruby's Kids Holiday Christmas Party Head Chaperone: December 2012

2010

Acres Home Science & Technology Academy Summer Experience Science Mentor: June 2010

2008

Sunday of Hope Initiative Volunteer: 2008-2009

Collaborated with local churches in an effort to raise funds for the St. Jude's Cancer Research Hospital

Paul E. Slaton Head Start Instructor: August 2008-May 2011

Mentor children at local head start schools to provide entertainment and learning opportunities once a week.

Grambling Community Achievement Foundation (G-CAF) Events Coordinator: February 2008- May 2011 Responsible for scheduling, coordinating, and managing all functions sponsored by or through the Grambling Community Achievement Foundation.