

INFO	MathDwight Ames, IA	dwight@mathdwright.com mathdwright.com
Foci	<p>Black youth and community</p> <p>Representation theory as a practice in equity</p> <p>Representation theory as a study of superalgebras and physical phenomena</p>	
PROJECTS	<p>Reduction superalgebras and solutions to equations arising from physics</p> <p>Combinatorics of generalized parking functions</p> <p>Decomposition and bases of infinite-dimensional representations of Lie superalgebras</p>	<p>Historical context of Black (Baltimorean) liberation strategies interconnecting with present-day learning of mathematics</p> <p>Student development through professional/research communities</p> <p>The topology of Black research mathematicians in America beginning with Elbert Frank Cox</p>
EDUCATION	<p>The University of Texas at Arlington, Arlington, TX Ph.D., Mathematics, May 2020 Bases of infinite-dimensional representations of orthosymplectic Lie superalgebras Advisor: Dimitar Grantcharov</p> <p>The Florida State University, Tallahassee, FL M.S., Pure Mathematics, May 2014</p> <p>Florida A&M University, Tallahassee, FL B.S., Mathematics, April 2012</p> <p>Nokomis Montessori; Skyview; Woodbury Junior High; Myers Park High School</p>	
APPOINTMENTS	<p>Facilitator</p> <p>Math Leaders 4 Racial Justice within Mathematics Leaders Exploring Racial Equity Charles A. Dana Center at The University of Texas at Austin, Austin, TX Director: David Kung</p> <p>Postdoc Research Associate NSF ECR-EHR Core Research Grant Studying Successful Doctoral Students in Mathematics from Underrepresented Groups</p>	<p>2022</p> <p>2020 – 2021</p>

Iowa State University, Ames, IA
 Supervisor: Michael Young
 Research Mentor: Jonas T. Hartwig

Postdoctoral Research Advisor 2021
 Mathematical Sciences Research Institute
 Undergraduate Program (MSRI-UP) (virtual)
Mathematical Sciences Research Institute, Berkeley, CA
 Research Director: Pamela E. Harris
 Lead Organizer: Rebecca Garcia

Graduate Teaching Assistant 2016 – 2020
The University of Texas at Arlington,
 Teaching Preparation: Minerva Cordero

Other Positions Held:

- Actuarial Intern, New York Life Insurance Company (Slepy Hollow, NY)
- Adjunct Instructor, Florida A&M University
- Florida IT Career Alliance Coordinator, The Florida State University
- Graduate Teaching Assistant, The Florida State University
- Owner, MathDwight
- Undergraduate Researcher, Florida A&M University
- Undergraduate Researcher, University of Iowa

DISTINCTIONS

MΣΣT a Mathematician
 Selected interviewee

2022

The University of Texas at Arlington

Graduate Assistance in Areas of National Need (GAANN) Fellow 2017 – 2020
 Outstanding GAANN Student, Department of Mathematics 2020
 Peer Mentor Award, Department of Mathematics 2018

American Mathematical Society

Joint Mathematics Meetings Travel Grant (\$500) 2019
 International Congress of Mathematicians Travel Grant (\$3,300) 2018

COMMUNICATION

★ = Invited

Graduate/Undergraduate student at time of submission (full name used)

Refereed Works in Mathematics

Published/Accepted (2) Submitted for Review (1)

Accepted (Joint with Yasmin Aguillon, Dylan Alvarenga, P. E. Harris, Surya Kotapati,
 J. Carlos Martínez Mori, Casandra D. Monroe, Zia Saylor, Camelle Tieu)
 On parking functions and the Tower of Hanoi.
 To appear in The American Mathematical Monthly.
 arXiv:2206.00541

Précis: Lah numbers; bijection between certain game-winning configurations of the Tower of Hanoi game and parking functions of displacement one

Published (Joint with J.T. Hartwig) Diagonal reduction algebra for $\mathfrak{osp}(1|2)$.
Theoretical and Mathematical Physics 210.2 (Feb. 2022), pp. 155–171.
ISSN: 0040-5779, 1573-9333. doi:10.1134/S0040577922020015
~~arXiv~~:2106.04380

Précis: Complete superalgebra presentation of generators and relations under \diamond product; extremal projector application; PBW-type basis; infinite subgroup of automorphisms; Scasimir/Casimir; dynamical central element

Submitted (Joint with J.T. Hartwig) Ghost center and representations of the diagonal reduction algebra of $\mathfrak{osp}(1|2)$.
~~arXiv~~:2203.08068

Précis: Full characterization of ghost center = center + anti-center; classification of all finite-dimensional irreducible representations; infinite-dimensional irreducible representations; Verma modules and Shapovalov forms; infinite-dimensional orthosymplectic Clebsch-Gordan recovery

Writing in progress: Type-Q extremal projectors; Oscillator representations of $\mathfrak{osp}(1|2n)$; BPAs and generalized parking functions; Solutions to extremal/physical equations via reduction superalgebras; Differential orthosymplectic reduction superalgebra; Bases of families of infinite-dimensional tensor product representations

Refereed Works in Education

Proceedings (C. Westine, S. Sword, M. Young, *Maya Bartel*, D. A. Williams II, P. E. Harris) Informing Change: Stories of Graduate Students from Underrepresented Groups in Mathematics Doctoral Programs
Association for the Study of Higher Education 46th General Conference.

Proceedings (S. Sword, M. Young, C. Westine, A. Winger, *Maya Bartel*, D. A. Williams II, *Christian McRoberts*, S. Sisneros-Thiry, M. Gates, P. E. Harris) Studying Successful Doctoral Students in Mathematics from Underrepresented Groups
Transforming Institutions 2021 Virtual Conference.

Additional Contributions

Writings

1. (R. Garcia, P. E. Harris, D. A. Williams II, *Cassandra Monroe*, *J. Carlos Martínez Mori*, *Tomás Aguilar-Fraga*, *Yasmin Aguillon*, *Daniel Alofameni Quiñonez*, *Dylan Alvarenga*, *Aalliyah Celestine*, *Parneet Gill*, *Imhotep B. Hogan*, *Jakeyl Johnson*, *Kobe Lawson-Chavanu*, *Lina Liu*, *Aaron Ortiz*, *Lauren Quesada*, *Cynthia Marie Rivera Sánchez*, *Christopher Soto*, *Camelle Tieu*, *Dirk Tolson III*, *Jacob van der Leeuw*, *Pamela Vargas*)
People Over Math: A Co-created Principle for Successful Research Communities.
MAA Focus 42.3 (2022), pp. 26–31. Digital edition. PDF.

2. ★ <Missed the mark> The International Congress of Mathematicians: A Math Conference for Everybody. (2018, Winter). *NAM Newsletter*. Retrieved from [https://www.nam-math.org/include/pages/files/newsletters/2018 Winter.pdf](https://www.nam-math.org/include/pages/files/newsletters/2018%20Winter.pdf)

Presentations on Community within Mathematics

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| | 2022 |
| 3. ★ The Joint Mathematics Meetings 2022
Seattle, Washington
"The ABCs of Pandemic Postdoc-ing" (virtual) | Apr |
| 4. ★ Williams College
OURSTEM+
<i>The Math Graduate School Experience</i> panelist | Mar |
| 5. ★ Tulane University
Math For All 2022 Conference
<i>Creating a new math world out of the shell of the old one</i> panelist (virtual) | Feb |
| | 2021 |
| 6. ★ West Virginia University
Student Chapter of the Association of Women in Mathematics
"Generations of Black Mathematicians" (virtual) | Feb |
| | 2020 |
| 7. ★ American Mathematical Society
<i>Advocating for Students of Color: There's More You Can Do</i> (virtual)
Joint with Pamela E. Harris, Vanessa Rivera Quiñones, Aris Winger, Michael Young | Oct – Dec |
| 8. ★ Institute for Mathematical and Statistical Innovation
<i>Student-led Initiatives</i> panelist
paraDIGMS Fall Conference (virtual) | Nov |
| 9. ★ State of Iowa
Governor's STEM Advisory Council
<i>Fostering Equity in the STEM Classroom</i> (virtual)
Joint with Pamela E. Harris, Aris Winger | Jun – Nov |
| 10. ★ Math SWAGGER Colloquium
"Defining your function" (virtual) | Oct |
| 11. ★ Pomona College
<i>Black in STEM</i> keynote | Mar |

12. ★ Florida A&M University
Kemetic Mathematical Society
Research and Graduate Programs (virtual) Feb
2019
13. The University of Texas at Arlington
Discussions in Algebra (DinA)
“Incompleteness theorem:
a graduating graduate student’s hard-knocks lessons” Oct
14. The University of Texas at Arlington
Graduate Chapter of The American Mathematical Society
“A Noether one:
the lives of Malone-Mayes, Mirzakhani, and Noether” Mar
15. National Association of Mathematicians
Undergraduate MATHFest XXIX
Southern University of New Orleans
The Graduate School Experience moderator Sep
2018
16. ★ National Association of Mathematicians
Undergraduate MATHFest XXVIII
Spelman College
Applying to Graduate School panelist Sep
17. The University of Texas at Arlington
Department of Mathematics
GAANN Day panelist Apr
2017
18. ★ The University of Texas at Arlington
Gulf States Math Alliance Conference
Facilitated Graduate Applications Process (F-GAP) panelist Feb
2016
19. ★ The University of Texas at Arlington
Department of Mathematics
GAANN Day panelist Apr
- Presentations on Theory of Mathematics** 2021
20. ★ “Diagonal reduction algebra of $\mathfrak{osp}(1|2)$ ”
Categorical and Combinatorial Methods in Representation Theory,
and Related Topics May
Spring Western Sectional Meeting, San Francisco State University (virtual)

21. "Reduction algebras and $\mathfrak{osp}(1|2)$ " I-II Apr
Algebra and Geometry Seminar, Iowa State University (virtual)
22. ★ "Relations, parity, and super representation theory" Jan
The Joint Mathematics Meetings 2021, Washington, D.C. (virtual)
2020
23. "From Lie algebras to Lie superalgebras" I-II Oct
Algebra and Geometry Seminar, Iowa State University (virtual)
24. "Bases of infinite-dimensional representations Apr
of orthosymplectic Lie superalgebras"
Dissertation Defense, The University of Texas at Arlington
25. ★ "It looks like calculus: Lie superalgebras acting on polynomials Mar
in commuting and anti-commuting variables"
Colloquium, California State Polytechnic University, Pomona
26. ★ "Finding bases of new infinite dimensional representations of Mar
 $\mathfrak{osp}(1|2n)$ "
Algebra/Number Theory/Combinatorics Seminar, Claremont Colleges
27. ★ "Basis of an infinite-dimensional tensor product representation Jan
of $\mathfrak{osp}(1|2n)$ "
The Joint Mathematics Meetings 2020, Denver, Colorado
2019
28. ★ "Infinite-dimensional tensor product representations Dec
of $\mathfrak{osp}(1|2n)$ and $\mathfrak{gl}(2n)$ "
Algebra and Geometry Seminar, Iowa State University
29. ★ "Bases of infinite-dimensional tensor product representations Nov
of $\mathfrak{osp}(1|2n)$ "
Representation Theory Seminar, Baylor University
30. ★ "Basis of an infinite-dimensional tensor product representation Oct
of $\mathfrak{osp}(1|2n)$ "
Algebra Seminar, University of North Texas
31. "Super Black Magic" Oct
Graduate Algebra Symposium, Texas A&M University
32. ★ "Keeping up with the signs: Mar
examples of Lie superalgebras and their representations"
Colloquium, Sam Houston State University
33. "Infinite-dimensional representations of $\mathfrak{osp}(1|2n)$ " Feb
Southwest Local Algebra Meeting, The University of Texas at El Paso
2018

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| 34. "Infinite-dimensional representations of $\mathfrak{osp}(1 2n)$ "
Blackwell-Tapia Conference, ICERM | Nov |
| 35. "Tensor product representations of $\mathfrak{osp}(1 2n)$ ",
Discussions in Algebra (DinA), The University of Texas at Arlington | Nov |
| 36. "Angles of Andy... simple roots"
Discussions in Algebra (DinA), The University of Texas at Arlington | Apr |
| 37. "Gelfand-Tsetlin subalgebras"
Discussions in Algebra (DinA), The University of Texas at Arlington | Mar |
| | 2017 |
| 38. "Supermathematics..."
UNT UTA OU Algebra Symposium, University of Oklahoma | Oct |
| 39. "Superalgebras"
Discussions in Algebra (DinA), The University of Texas at Arlington | Oct |
| 40. "Magmas, loops, and other not-quite groups"
UNT UTA OU Algebra Symposium, The University of Texas at Arlington | Apr |
| 41. "Solutions to Hungerford exercises on Hom and Duality"
Discussions in Algebra (DinA), The University of Texas at Arlington | Feb |
| | 2016 |
| 42. "Survey of algebraic objects"
Discussions in Algebra (DinA), The University of Texas at Arlington | Oct |
| | 2013 |
| 43. "A complex investigation of Pythagorean triples"
Complex Analysis Seminar, The Florida State University | Nov |
| | 2011 |
| 44. "Cyclotomy and representation Theory"
Iowa Summer Research Symposium, University of Iowa | Jul |

TEACHING

Instructor of Record

- o The University of Texas at Arlington
Summer 2017 – Fall 2017 & Fall 2018 – Spring 2020
Courses: Business Calculus, Calculus III (2 sections), College Algebra (Pilot), Linear Algebra (2 sections), Preparation for Calculus
- o Florida A&M University
Fall 2015 – Spring 2016
Courses: Business Calculus (4 sections), Intermediate Algebra (2 sections)

Seminar Designer

- o Iowa State University
Fall 2020 – Spring 2021
Seminars: Graduate Algebra & Qualifying Examinations (*The Reunion*),
Post-baccalaureate Professional Development & Advising (*PB Party*)

Guest Lecturer

- o The University of Texas at Arlington
Courses: Abstract Algebra (Graduate), Contemporary Mathematics, Lie
Algebras (Graduate), Number Theory

Teaching Assistant

- o The University of Texas at Arlington
Fall 2016 – Spring 2017 & Spring 2018
Course: Preparation for Calculus (6 sections)
- o The Florida State University
Fall 2012 – Spring 2014
Courses: Analytic Trigonometry (11 sections), Calculus for Business (8
sections), College Algebra (11 sections), Precalculus Algebra (5 sections)

Grader

- o The University of Texas at Arlington
Spring 2018 & Spring 2019
Course: Linear Algebra

ADVISING

Undergraduate Research


MSRI-UP 2021 (18 undergraduates total)

Advisees: Aaron Ortiz, Lauren J. Quesada, Cynthia Marie Rivera Sánchez
Research report: The defective parking space

Advisees: Tomás Aguilar-Fraga, Kobe Lawson-Chavanu,
Dirk Tolson III
Research report: ℓ -Interval parking functions

SERVICE
(SINCE 2012)

Organizer

Black in Math Week 

- Co-organizers: Anna Gifty Opoku-Agyeman, Marissa Kawehi Loving, Omayra Ortega, Candice R. Price, Noelle Sawyer, Angela Tabiri, Michole Washington

Hidden NORMS (Webinar): Navigating Obstructive Rules in the Mathematical Sciences

- Co-organizers: **Kimberley P. Hadaway**, Pamela E. Harris, **Daniel Chenen Qin**, Vanessa Rivera Quiñones

American Mathematical Society

- Special Session on Superalgebras, Quantum Groups, and Related Topics
- Founding president of UTA Graduate Chapter and website creator
- Creator of Graduate Student Seminar

Visitors/Speakers (institution at time of visit)

- Mayowa Awe (Lockheed Martin)
- Edray Goins (Purdue University)
- Mark Jackson (Raytheon)
- Craig J. Sutton (Dartmouth College)
- Talitha Washington (Howard University & National Science Foundation)

Discussions in Algebra (DinA)

- Scheduled speakers for DinA at The University of Texas at Arlington

Grad2Grad

- Created and coordinated a peer-to-peer studying collaborative for graduate Linear Algebra and Analysis

K-12 Mentor

Mid-Cities Math Circle (MC)²

- Promoted problem solving and mathematical fun amongst youth

R. Frank Nims Middle School (Tallahassee, FL)

- Created STEM lesson plans and taught 15 eighth graders on Saturday mornings

Undergraduate Mentoring

MSRI-UP

- Mentor to 18 undergraduates in an intensive 6-week mathematical research program and commitment to personal, academic, and professional development

National Association of Mathematicians (NAM)

- Served as NAM Undergraduate MATHFest oral presentation judge

Florida-Georgia Louis Stokes Alliance for Minority Participation (LSAMP)

- Adapted program as a recognized student organization (RSO) at The Florida State University
- Mentor to 30 undergraduates in scientific fields where significant members of their respective disciplines othered them

Committee Member

Social Action Committee

- Responded to community issues and campus climate via the Black Faculty and Staff Association of Iowa State

Mathematics Faculty Search Committee

- Represented students in evaluating candidates for faculty positions in the Department of Mathematics at Florida A&M University

Community Volunteer

Dallas-Fort Worth Metroplex

- UT Arlington Calculus Bowl set-up crew member and pizza server
- Forth Worth Regional Science Fair safety inspector

Reviewer

zbMATH reviewer

- MSC Primary: 17A70; MSC Secondary: 17B20

Book reviewer

- *Asked and Answered: Dialogues on Advocating For Students of Color in Mathematics*

MEMBERSHIPS

National Association of Mathematicians

American Mathematical Society (sponsored)

SKILLS

Coding & Computing

Active Sample: \LaTeX , MATLAB, HiddenNORMS website, MSRI-UP 2021 website

Past Experiences: Access, APL, C, Excel, Python

Networking & Team Building

Active Sample: Co-organizing Black education research reading group

Past Experiences: HCASC captain/champion

Relating

Active Sample: Mentoring undergraduates and graduate students (math and non-math majors)

Past Experiences: Interviewer