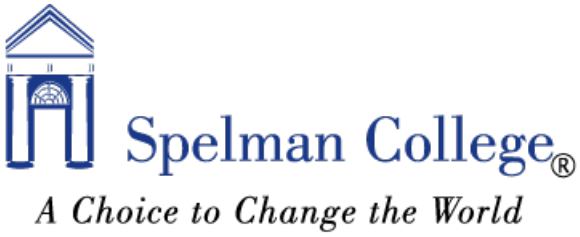
National Association of Mathematicians, Inc.

Undergraduate MATHFest XXVIII



September 28 – 30, 2018

Spelman College

Atlanta, Georgia

http://nam-math.org/mathfest.html#XXVIII

NATIONAL ASSOCIATION OF MATHEMATICIANS, INC.

Welcome to NAM's Undergraduate MATHFest XXVIII!

Over the next few days, you'll have the opportunity to meet people from HBCUs, HSIs, PWIs, Research I Universities, and Liberal Arts Colleges. (If you don't know what any of these mean, this is a hint to use this conference to find out . . .) You'll have the opportunity to learn some interesting mathematics, hear some great talks, and solve some challenging problems. And you'll have the opportunity to get some SWAG!

This is the 28th annual conference for NAM. We have 143 participants from 27 schools:

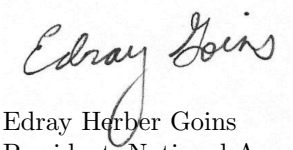
- Allen University,
- American University,
- Belmont University,
- Elizabeth City State University,
- Florida A&M University,
- Georgia Institute of Technology,
- Hampton University,
- Howard University,
- Iowa State University,
- Morehouse College,
- Morgan State University,
- North Carolina A&T State University,
- Pomona College,
- Prairie State College,
- Savannah State University,
- Southern University at New Orleans,
- Southern University at Baton Rouge,
- Spelman College,
- Tennessee State University,
- Texas Southern University,
- University of Arkansas at Pine Bluff,
- University of California at Riverside,
- University of Massachusetts,
- University of Michigan at Ann Arbor,
- University of San Diego,
- University of Texas at Arlington,
- University of the District of Columbia,
- Virginia State University, and
- Xavier University of Louisiana.

Of these 143 participants, 87 are women, 56 are men, and 105 identify as Black or African American. We have 9 students speaking, as well as 13 students presenting posters.

We are especially grateful for support from Monica Stephens (Spelman College), Ulrica Wilson (Morehouse College), and Helen Grundman (American Mathematical Society) for assisting with the planning and organizing. If you see them around, be sure to thank them as well.

We are very excited about this year's conference. I attended my first MATHFest over 10 years ago, and have looked forward to returning every year. I sincerely hope that you will have a great experience.

Enjoy MATHFest!



Edray Herber Goins
President, National Association of Mathematicians, Inc.

NAM National Office ■ c/o Leon Woodson ■ Morgan State University ■ 1700 East Cold Spring Lane ■ Baltimore MD 21251
http://www.nam-math.org ■ http://www.nam-math.tumblr.com ■ http://www.nam-newsletter.org ■ http://www.facebook.com/namnewsletter
Office: (765) 494-1936 ■ Fax: (765) 494-0548 ■ E-mail: president@nam-math.org ■ Url: http://www.nam-math.org/

NAM's Undergraduate MATHFest XXVIII

The National Association of Mathematicians (NAM) is a non-profit professional organization in the mathematical sciences with membership open to all persons interested in the mission and purpose of NAM which are (1) promoting excellence in the mathematical sciences and (2) promoting the mathematical development of all underrepresented minorities. NAM was founded in 1969; in 2019, we will celebrate our 50th anniversary.

NAM has five meetings every year: the Joint Mathematics Meetings in the Winter; and the Regional Faculty Conference on Research and Teaching Excellence (FCRTE) in the Spring; the Computational Sciences Institute in the Early Summer Fall; the MAA MathFest in the Late Summer; the NAM MathFest in the Fall. NAM's Undergraduate MATHFest is a three-day meeting, typically Friday through Sunday in the Fall, which rotates around the country based on NAM's regional structure. It is held annually to encourage students to pursue advanced degrees in mathematics and mathematics education. The conference is geared for undergraduates from Historically Black Colleges and Universities (HBCUs), although all are welcome to attend. The conference consists of five components:

- **Student Talks**
  There will be ten talks given by undergraduate and graduate students which last 30-minutes each. Each talk should be 20 minutes long, allowing for 10 minutes of questions and answers. There will be a friendly competition for the most outstanding oral presentation.

- **Poster Presentations**
  Students have the opportunity to present posters outlining their research. The Poster Session will take place Saturday afternoon from 3:30 PM - 5:00 PM. There will be a friendly competition for the most outstanding poster presentation.

- **Graduate Fair**
  Universities will have an opportunity to showcase their graduate programs and interact with undergraduate students in a two-hour fair. The Graduate Fair will take place Saturday afternoon from 3:30 PM - 5:00 PM.

- **Problem Time with Dr. Cooper**
  Throughout the conference, students will be presented challenge problems. Students with correct solutions will be presented prizes.

- **The J. Ernest Wilkins Lecture**
  This is an hour-long talk, given by an established researcher, to motivate our undergraduates to continue to pursue research in the mathematical sciences. This year's Wilkins Lecturer is Michelle Craddock Guinn (Belmont University University); her talk will be Friday from 4:00 PM - 5:00 PM.

We are thankful to sponsorship of the prizes for the talks, poster session, and "Problem Time" by the Education and Diversity Department of the American Mathematical Society (AMS). This conference is based upon work supported by the National Science Foundation under Grant No. 1833234. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the National Association of Mathematicians, Inc. and do not necessarily reflect the views of the National Science Foundation.

Which MathFest Came First?

NAM's Undergraduate MATHFest began in 1991, and it inspired other similar undergraduate-focused conferences over the years.

- The Mathematical Association of America (MAA) MathFest began in 1997, with a meeting in Atlanta, Georgia. According to Zitarelli:

  > A historic change for MAA national meetings took place in 1996 when the AMS voted to disband its summer gatherings. The MAA decided to continue alone, adopting the name "MathFest" starting in 1997, and has sponsored this meeting every summer since then.

- The American Statistical Association (ASA) StatFest began in 2001, with a meeting on November 1, 2001 at Spelman College.

- The National Math Festival, a biennial conference which began in 2015, was originally slated to be called "MathFest." In fact, the domain name `MathFest.org` redirects to this conference.

J. Ernest Wilkins Lecture

Michelle Craddock Guinn, Associate Professor of Mathematics at Belmont University

Enhancing Imagery Techniques

ABSTRACT: The objective of my research is to design an algorithm to enhance stereoscopic imagery so that it adapts to the viewing distance of the observer, with seamless transitions among stereo and hyperstereo levels. The goal of this research is to develop an algorithm to provide hyperstereo in conjunction to stereo enhancing the depth information needed to improve performance and judgment. A technique to augment the benefits of stereo and hyperstereo will be the focus of this research. The algorithm will use image smoothing, blending and edge detection techniques to provide this enhancement.

BIOGRAPHY: Michelle Craddock Guinn is originally from Decatur, Georgia. She graduated from Southwest DeKalb High School and went to Spelman College in Atlanta, GA where she majored in mathematics. Michelle received both masters and doctoral degrees in Mathematics from the University of Mississippi in Oxford, MS. Her area of study was Functional Analysis. After graduation, she accepted a post-doctoral position at the United States Military Academy in West Point, NY and later awarded the Davies Fellowship which allowed her the time to research Image Processing at the United States Army Research Laboratory (ARL) in Adelphi, MD. She joined the Department of Mathematics and Computer Science at Belmont University in the fall of 2013, and she was recently promoted to Associate Professor and earned tenure. She is the first African American to be granted tenure and promotion in the Mathematics and Computer Science Department at Belmont University, and she is the second in the College of Science and Mathematics. She has two daughters that make this journey of life meaningful.

Jesse Ernest Wilkins, Jr.

The **J. Ernest Wilkins Lecture** series was inaugurated in 1994 during NAM's Undergraduate MATHFest IV at North Carolina A&T. It is named in honor of Jesse Ernest Wilkins, Jr. (November 27, 1923 – May 12, 2011), an internationally recognized nuclear scientist, mechanical engineer and mathematician.

J. Ernest Wilkins was known in the press as the "Negro Genius." Wilkins received his B.S. degree as a Phi Beta Kappa graduate at the age of 16, his M.S. degree at age 17, and his Ph.D. degree at the age of 19. Although he has been highly praised as a superb practitioner of his crafts, Wilkins is also widely recognized and acclaimed as a highly productive scholar, having published more than 80 journal articles and having produced an additional 22 unpublished reports for the Atomic Energy Commission. Wilkins is the only African American mathematician-engineer elected as a Fellow to the National Academy of Engineering (NAE).

The inaugural lecture was given by Wilkins himself. The Lecture is to be given annually at the Undergraduate MATHFest, a conference for which Wilkins was a frequent attendee.

Conference Schedule

Friday, September 28	
1:00 PM – 4:00 PM Living and Learning Center II Atrium	On-Site Registration
1:30 PM – 1:45 PM Renaissance Concourse Atlanta Airport Hotel	Bus Leaves Renaissance Concourse for Spelman College with A-National Limousine Service, Inc.
2:00 PM – 2:30 PM Living and Learning Center II Auditorium	**Greetings and Conference Orientation** Edray Herber Goins, President of NAM Monica Stephens, Mathematics Department Chair at Spelman College Mary Schmidt Campbell, President of Spelman College – *on Saturday Morning* Duane Cooper, Mathematics Department Chair at Morehouse College Helen Grundman, Director of Education and Diversity at the AMS
AFTERNOON SESSION	**Moderator: Candice Price (University of San Diego)**
2:30 PM – 3:00 PM Living and Learning Center II Auditorium	*On the Analysis of Cycles in the Symmetric Group* Michael English (Clark Atlanta University) and Torina D. Lewis (Clark Atlanta)
3:00 PM – 3:30 PM Living and Learning Center II Auditorium	$SL_2(\mathbb{Z})$ *Action on Some Genus g Surfaces* Paige Helms (University of California at Riverside)
3:30 PM – 4:00 PM Living and Learning Center II Atrium	Beverage Break Catered by Spelman Catering
4:00 PM – 5:00 PM Living and Learning Center II Auditorium	**J. Ernest Wilkins Lecture** *Enhancing Imagery Techniques* Michelle Craddock Guinn (Belmont University) Introduction by Maya Jones
5:00 PM – 7:00 PM Living and Learning Center II Atrium	Reception Catered by Spelman Catering Sponsored by the Education and Diversity Department of the AMS
7:00 PM – 7:15 PM Living and Learning Center II Atrium	Bus Returns to Renaissance Concourse with A-National Limousine Service, Inc.

Saturday, September 29	
8:00 AM – 8:15 AM Renaissance Concourse Atlanta Airport Hotel	Bus Leaves Renaissance Concourse for Spelman College with A-National Limousine Service, Inc.
8:00 AM – 9:00 AM Science Center 134 NASA Auditorium Lobby	**Continental Breakfast** Catered by Spelman Catering
8:00 AM – 12:00 PM Science Center 134 NASA Auditorium Lobby	On-Site Registration
MORNING SESSION	**Moderator: Julian Apelete Allagan (Elizabeth City State)**
9:00 AM – 9:30 AM Science Center 134 NASA Auditorium	*E-Positivity and Uniqueness of Chromatic Symmetric Functions* Sofia Martinez Alberga (University of California at Riverside)
9:30 AM – 10:00 AM Science Center 134 NASA Auditorium	*Application of Grobner Bases in Graph Theory* Kaila Crosse (University of Michigan at Ann Arbor)
10:00 AM – 10:30 AM Science Center 134 NASA Auditorium Lobby	Beverage Break Catered by Spelman Catering
10:30 AM – 11:00 AM Science Center 134 NASA Auditorium	*Investigating First Returns: The Effect Of Multicolored Vectors* Shakuan Frankson (Howard University) and Myka Terry (Morgan State)
11:00 AM – 11:30 AM Science Center 134 NASA Auditorium	*Cryptographic Vulnerabilities in Network Protocols* Damien Burks (Texas Southern University)
11:30 AM – 12:00 PM Science Center 134 NASA Auditorium	**Problem Time with Dr. Cooper** Round 1 of 3 Duane Cooper (Morehouse College)
12:00 PM – 1:00 PM Albert E. Manly College Center Atrium	**Lunch** Catered by Spelman Catering

Saturday, September 29	
AFTERNOON SESSION	**Moderator: Melanie Eddins-Spencer (Prairie State College)**
1:00 PM – 1:30 PM Science Center 134 NASA Auditorium	*The Fibonacci Sequence in 21st Century Pop Music* Ariana N. Brown (Spelman College)
1:30 PM – 2:00 PM Science Center 134 NASA Auditorium	*Dynamics of a mathematical model for four-state binocular rivalry* FranChell Davison (Texas Southern University)
2:00 PM – 3:00 PM Science Center 134 NASA Auditorium	Panel: *Applying to Graduate School* FranChell Davidson (Texas Southern University) Lydia Wheatfall (Virginia State University) Dwight Williams (University of Texas at Arlington) Derek Young (Iowa State University)
2:00 PM – 3:00 PM Science Center 145	**Math Institutes Town Hall** A Gathering for Faculty Ulrica Wilson (Morehouse College / ICERM)
3:00 PM – 3:30 PM Science Center 134 NASA Auditorium	**Problem Time with Dr. Cooper** Round 2 of 3 Duane Cooper (Morehouse College)
3:30 PM – 4:00 PM Science Center 134 NASA Auditorium Lobby	Group Photo Beverage Break Graduate Fair and Poster Set-Up
4:00 PM – 5:00 PM Science Center 134 NASA Auditorium Lobby	Graduate Fair / Poster Session Poster Presentation Judges: Shinemin Lin (Savannah State University) Phyllis Okwan (Southern University, Baton Rouge) Kenuatra Smith (Southern University, Baton Rouge) Lila Ghemri (Texas Southern University)
5:15 PM – 5:30 PM Albro-Falconer-Manley Science Center	Bus Returns to Renaissance Concourse with A-National Limousine Service, Inc.
7:00 PM – 9:00 PM Renaissance Concourse Atlanta Airport Hotel	**Undergraduate MATHFest XXVIII Appreciation Dinner**

Sunday, September 30	
8:00 AM – 8:15 AM Renaissance Concourse Atlanta Airport Hotel	Bus Leaves Renaissance Concourse for Spelman College with A-National Limousine Service, Inc.
8:00 AM – 9:00 AM Science Center 134 NASA Auditorium Lobby	**Continental Breakfast** Catered by Spelman Catering
MORNING SESSION	**Moderator: Leslie Hogben (American Institute of Mathematics)**
9:00 AM – 9:30 AM Science Center 134 NASA Auditorium	*Processing Speed as the Moderator in the Link Between Executive Functioning and Math Achievement* Maya Jones (Spelman College)
9:30 AM – 10:30 AM Science Center 134 NASA Auditorium	Panel: *The Next Step: REUs and Internships* Duane Cooper (Morehouse College) Edray Herber Goins (Pomona College) Monica Jackson (American University)
10:30 AM – 11:00 AM Science Center 134 NASA Auditorium	**Problem Time with Dr. Cooper** Round 2 of 3 Duane Cooper (Morehouse College)
11:00 AM – 11:30 AM Science Center 134 NASA Auditorium Lobby	Beverage Break Judges Tally Scores
11:30 AM – 11:45 AM Science Center 134 NASA Auditorium	**Awards Ceremony** Oral Presentation Judges: Helen G. Grundman (American Mathematical Society) Kenneth Jones (Elizabeth City State University) Rhonda Vonshay Sharpe (Women's Institute for Science, Equity and Race) Bhikhari Tharu (Spelman College) Sindhu Unnithan (Xavier University of Louisiana)
11:45 AM – 12:00 PM Science Center 134 NASA Auditorium	Closing Remarks Tasha Inniss, Associate Provost for Research at Spelman College
12:00 PM – 1:00 PM Science Center 134 NASA Auditorium Lobby	**Lunch** Catered by Spelman Catering
2:00 PM – 2:15 PM Albro-Falconer-Manley Science Center	Bus Returns to Renaissance Concourse with A-National Limousine Service, Inc.

Attendees

Name	Affiliation	E-Mail
Mikaili Abdullah	Morehouse College	mikaili.o.abdullah@gmail.com
Cheryl Adeyemi	Virginia State University	cadeyemi@vsu.edu
Abdul-Haqq Agness	California Polytechnic University at Pomona	aagness@cpp.edu
Nathan Alexander	Morehouse College	nathan.alexander@morehouse.edu
Ashley Alfred	Capital Area Family Violence Intervention Center	ashley_alfred_02@subr.edu
Julian Apelete Allagan	Elizabeth City State University	adallagan@ecsu.edu
Titus Atwater	Tennessee State University	tatwate3@my.tnstate.edu
Christopher Austin	Florida A&M University	Christopher2.Austin@famu.edu
Tykira Beasley	Elizabeth City State University	tsbeasley267@students.ecsu.edu
Lyric Bell	Spelman College	lbell13@scmail.spelman.edu
Juston Blue	Elizabeth City State University	jtblue942@students.ecsu.edu
Fred Bowers	Spelman College	fbowers@spelman.edu
Robert E. Bozeman	Morehouse College	rbozeman2@bellsouth.net
Sylvia Bozeman	Spelman College	sylvia.bozeman12@att.net
Ariana Brown	Spelman College	abrow212@scmail.spelman.edu
Nia Brown	Saint Mary's STEM Center	inimini3@gmail.com
Viveka Brown	Spelman College	vborum@spelman.edu
Damien Burks	Texas Southern University	dburksgtr@gmail.com
Willie Byrd	Tennessee State University	wbyrd4@my.tnstate.edu
Jailyn Clark	Spelman College	jclark46@scmail.spelman.edu
Cher Crockett	Texas Southern University	cher.crockett@tsu.edu
Cahron Cross	Prairie State College	ccross8580@students.prairiestate.edu
Kaila Crosse	University of Michigan at Ann Arbor	kcrosse1@scmail.spelman.edu
Itzel Cruz	University of California at Riverside	icruz003@ucr.edu
FranChell Davidson	Texas Southern University	f_davidson@icloud.com
Harold Dawson	TBA	dawsonharold@gmail.com

Name	Affiliation	E-Mail
Marcus Dean	Tennessee State University	dean15434@gmail.com
DaLisa Nanelle Denham	Virginia State University	nanelledenham129@gmail.com
Samael Dor	Southern University at New Orleans	samaeldor@yahoo.com
Demetrius Dukes	University of Arkansas at Pine Bluff	dukesd0000@uapb.edu
Yasmin Eady	North Carolina A&T State University	yeady@aggies.ncat.edu
Melanie Eddins-Spencer	Prairie State College	meddinsspencer@prairiestate.edu
Michael English	Clark Atlanta University	m.english9203@gmail.com
Joan Evans	Texas Southern University	joan.evans@tsu.edu
Theotis Evans	Tennessee State University	tevans34@my.tnstate.edu
Jeff Fitih	Tennessee State University	jfitih@my.tnstate.edu
Shakuan Frankson	Howard University	shakuan.frankson@bison.howard.edu
Ebony Gadson	Spelman College	gadson@scmail.spelman.edu
Wade Garner	University of Arkansas at Pine Bluff	garnerw8234@uapb.edu
Lila Ghemri	Texas Southern University	lila.ghemri@tsu.edu
Joel Goddot, III	Virginia State University	joel.goddot@gmail.com
Edray Goins	Pomona College	ehgoins@mac.com
Chayla Graham	University of Arkansas at Pine Bluff	grahamc1954@uapb.edu
Shania Greenwood	Prairie State College	shania.greenwood2@gmail.com
Helen G. Grundman	American Mathematical Society	hgg@ams.org
Michelle Craddock Guinn	Belmont Univerisity	michelle.guinn@belmont.edu
Anna Harris	University of Arkansas at Pine Bluff	harrisa@uapb.edu
Leona Harris	University of the District of Columbia	leonaharrisphd@gmail.com
Diahmin Hawkins	Tennessee State University	dhawki10@my.tnstate.edu
Paige Helms	University of California at Riverside	phelm001@ucr.edu
Justin Hinds	Tennessee State University	jhinds@my.tnstate.edu
Leslie Hogben	American Institute of Mathematics	hogben@aimath.org
Samuel Hood	Morehouse College	samuelhood19@gmail.com
Johnny Houston	NAM / Elizabeth City State University	jlhouston602@gmail.com

Name	Affiliation	E-Mail
Zohreh Howard	University of Arkansas at Pine Bluff	howardz@uapb.edu
Sha'nee Hulsey	University of Arkansas at Pine Bluff	hulseys3411@uapb.edu
Cayla Jackson	Tennessee State University	cjacks97@my.tnstate.edu
Jaron Jackson	Georgia Institute of Technology	jaron.jackson333@gmail.com
Monica Jackson	American University	monica@drlady.com
Kiandra Johnson	Spelman College	kjohn114@spelman.edu
Najallah Johnson	University of Arkansas at Pine Bluff	johnson0229@uapb.edu
Rashunda Johnson	University of Arkansas at Pine Bluff	johnsonr@uapb.edu
Shequira Johnson	Southern University, Baton Rouge	shequira_johnson_00@subr.edu
Kenneth Jones	Elizabeth City State University	kljones@ecsu.edu
Maya Jones	Spelman College	majones@scmail.spelman.edu
Tyra Jones	Spelman College	tjone143@scmail.spelman.edu
Elvis Kahoro	Pomona College	ekka2016@mymail.pomona.edu
Rayanatou Keita	University of California at Riverside	rkeit002@ucr.edu
Lauri Kight	Southern University at Baton Rouge	lauri_kight_00@subr.edu
Malik Lewis	Allen University	mtlewis52@stu.allenuniversity.edu
Shinemin Lin	Savannah State University	lins@savannahstate.edu
Davell Lloyd	University of Arkansas at Pine Bluff	lloydd4766@uapb.edu
Sofia Martinez Alberga	University of California at Riverside	smart040@ucr.edu
Imani Marshal	Tennessee State University	imarsha3@my.tnstate.edu
Sageda Mason	Southern University, Baton Rouge	sagedamason@yahoo.com
Tim McEldowney	University of California at Riverside	tmcel001@ucr.edu
Maati McKinney	Spelman College	mmckinn6@scmail.spelman.edu
Dequante McKoy	Elizabeth City State University	dmckoy761@students.ecsu.edu
Miranda Merritt	Spelman College	mmerrit2@scmail.spelman.edu
Colm Mulcahy	Spelman College	colm@spelman.edu
Isaiah Neal	University of Arkansas at Pine Bluff	neali9581@uapb.edu
Janie Neal	Pomona College	janiel.neal@gmail.com

Name	Affiliation	E-Mail
Sylvia Nwakanma	Pomona College	sank2015@mymail.pomona.edu
Stephanie Obwar	Spelman College	sobwar@scmail.spelman.edu
Kessiena Ofunrein	Hampton University	kess.ofunrein@yahoo.com
Phyllis Okwan	Southern University, Baton Rouge	phyllis_okwan@subr.edu
Chanae Ottley	Florida A&M University	ckottley97@gmail.com
Marqus Parker	North Carolina A&T State University	mtparker2@aggies.ncat.edu
Shelby Pauling	Spelman College	spauling@scmail.spelman.edu
Wanda Payne	Tennessee State University	wpayne1@tnstate.edu
Edgar Perez	Southern University, Baton Rouge	edgarperez103@gmail.com
Candice Price	University of San Diego	cprice@sandiego.edu
Abdollah Rabieh	Allen University	arabieh@allenuniversity.edu
Danielle Rauls	University of Arkansas at Pine Bluff	raulsd4891@uapb.edu
Ivan Raykov	University of Arkansas at Pine Bluff	raykovi@uapb.edu
Michael Reed	Tennessee State University	mreed4@tnstate.edu
Kamryn Robertson	Tennessee State University	krober18@my.tnstate.edu
Lilshay Rogers	Elizabeth City State University	lilshay1999.lr@gmail.com
Catherine Rono	Spelman College	crono@scmail.spelman.edu
Giordan Rose	Tennessee State University	grose@my.tnstate.edu
Wynter Sanderlin	Tennessee State University	wsanderl@my.tnstate.edu
Tiffanie Scruggs	Spelman College	tscruggs@spelman.edu
Endy Segundo	University of California at Riverside	endysegundo@gmail.com
Rhonda Vonshay Sharpe	Women's Institute for Science, Equity and Race	rhondavsharpe@wiserpolicy.org
Joya Sims	Spelman College	jsims22@scmail.spelman.edu
Cynthia Singleton	Southern University at New Orleans	CSingleton@suno.edu
Arnel Smith	Tennessee State University	arnelsmith1234@gmail.com
Brooke Smith	Spelman College	bsmith80@scmail.spelman.edu
Kenuatra Smith	Southern University, Baton Rouge	kenuatra_smith@subr.edu
Kiara Smith	Tennessee State University	ksmit138@my.tnstate.edu
Joshua Sparks	Morehouse College	joshua.sparks@morehouse.edu

Name	Affiliation	E-Mail
Monica Stephens	Spelman College	mstephens@spelman.edu
David Tanner	Southern University, Baton Rouge	david_tanner_00@subr.edu
Isaac Tate	University of California at Riverside	ijetate@yahoo.com
William Taylor	Tennessee State University	wtaylo17@tnstate.edu
Myka Terry	Morgan State University	myter1@morgan.edu
Bhikhari Tharu	Spelman College	btharu@spelman.edu
Mariah Turner	TBD	Turnermariah2512@gmail.com
Itoro Umoh	University of California at Riverside	iumoh001@ucr.edu
Sindhu Unnithan	Xavier University of Louisiana	sunnitha@xula.edu
Liana Vigoa	Florida A&M University	lianasoevigoa@gmail.com
Karl Walker	University of Arkansas at Pine Bluff	walkerk@uapb.edu
Farrah Ward	Elizabeth City State University	fjward@ecsu.edu
Timyah Wellmaker	University of Arkansas at Pine Bluff	wellmat9067@uapb.edu
Lydia Wheatfall	Virginia State University	lydiawheatfall@gmail.com
Nathaniel Whitaker	University of Massachusetts at Amherst	whitaker@math.umass.edu
Coyrianna White	Tennessee State University	cwhite62@my.tnstate.edu
Dwight Williams	University of Texas at Arlington	mathdwight@gmail.com
Mack Williams	Xavier University of Louisiana	mwilli74@xula.edu
Roselyn Williams	Florida A&M University	Roselyn.Williams@famu.edu
Paulette Willis	National Association of Mathematicians	paulette.n.willis@gmail.com
Anesha Wilson	University of Arkansas at Pine Bluff	wellmat9067@uapb.edu
Joycelyn Wilson	Spelman College	jwilso20@spelman.edu
Ulrica Wilson	Morehouse College	ulrica.wilson@morehouse.edu
Leon Woodson	Morgan State University	leon.woodson@morgan.edu
Tong Wu	Texas Southern University	Tong.Wu@tsu.edu
Daryl Wymes	Florida A&M University	daryl1.wymes@famu.edu
Derek Young	Iowa State University	ddyoung@iastate.edu
Trinity Young	Tennessee State University	tyoung48@my.tnstate.edu

Oral Presentation Abstracts

1. Eniola Bankole (Texas Southern University), FranChell Davison (Texas Southern University), and Yunjiao Wang (Texas Southern University)

   Dynamics of a mathematical model for four-state binocular rivalry

   Saturday from 1:30 PM – 2:00 PM

   Binocular rivalry is a visual perception phenomenon in which the percept alternates between several different images while the stimuli remain unchanged. This phenomenon has long been employed to study visual awareness and its underlying cortical mechanisms. Many works on perceptual rivalry focus on bistable perceptual rivalry while only a minuscule amount of work considers rivalry between more than two percepts (multistable perceptual rivalry). However, multistable perceptual rivalry offers more tools for studying the brain than the bistable approach. In this work, we present a mathematical model that accounts for quadra-state binocular rivalry observed in several sets of experiments. We find that both slow adaptation and noise are needed to produce stochastic switching. We also provide a different view on the source of the four percepts from a dynamical system aspect.

2. Ariana N. Brown (Spelman College)

   The Fibonacci Sequence in 21st Century Pop Music

   Saturday from 1:00 PM – 1:30 PM

   In 1202, Fibonacci, an Italian mathematician, created a mathematical sequence to model the reproduction of rabbits. Fibonacci used his sequence to explore patterns found in multiple areas outside of mathematics such as: nature, art, and architecture. Additionally, the Fibonacci sequence can be found in various forms of classical music. However, limited research has examined the Fibonacci sequence in other musical genres. This research explores the properties of the Fibonacci sequence and twenty-first century pop music. The question motivating this study is: Do the properties of the Fibonacci Sequence have a relationship with twenty-first century pop music? Five properties of the Fibonacci sequence were examined. After analyzing several articles that reviewed the Fibonacci Sequence in classical music, an in-depth inquiry revealed connections between two of the five properties. The relatively prime and the proportionality properties were the two analyzed in this study. Musical pieces from artists John Legend and Alessia Cara were examined using the above properties. Future research can determine if other mathematical properties or sequences influence the popularity of a song.

3. Damien Burks (Texas Southern University)

   Cryptographic Vulnerabilities in Network Protocols

   Saturday from 11:00 AM – 11:30 AM

   Data security is one of the challenging issues of today that touches many areas in computing and communications. Cryptography is a mathematical technique that ensures the confidentiality and the integrity of the user's data. As technology continues to evolve and new communication protocols are developed, unforeseen vulnerabilities in network protocols are exploited with advanced tools that retrieve and decrypt keys/data.

   In this study, we aim to identify and highlight network protocols and the vulnerabilities in encryption methods used and propose a solution that can address this problem.

4. Kaila Crosse (University of Michigan at Ann Arbor)

   Application of Grobner Bases in Graph Theory

   Saturday from 9:30 AM – 10:00 AM

   In this presentation I will talk I will start with a topic in abstract algebra called polynomial rings and ideals in polynomial rings, which are important objects of study in ring theory. One of the classical results in ideals of polynomial rings is the Hilbert's Basis Theorem that guarantees every ideal is finitely generated. A simple yet computationally important way to find generators for ideals is via Grobner Bases. Once we establish that concept I will move on to one of the applications of Grobner bases to a graph theory problem called three colorability of a given graph.

5. Michael English (Clark Atlanta University) and Torina D. Lewis (Clark Atlanta University)

   On the Analysis of Cycles in the Symmetric Group

   Friday from 2:30 PM – 3:00 PM

   In the realm of Abstract Algebra, the symmetric group, denoted by S_n, defined over a finite set on $n \geq 3$ symbols is the group whose elements are all permutation operations that can be performed on n distinct symbols. The generalized formula $\frac{|S_n|}{\prod_{i=1}^{n}(j^{a_j})*(a_j!)}$ determines the number of permutations in S_n with a given cycle structure. In the proposed research, we extract information from the generalized formula and produce a simplified formula $\frac{n!}{(n-m)m!}$ to calculate the order of elements of the symmetric group that have a cycle configuration. Moreover we calculate successive cycle sizes. That is, cycles of size $n-1$, $n-2$, $\ldots$, $n-m+1$, where m is the number of "fixed points" in a permutation configuration or the number of one element orbits in equivalent cyclic notation. With this simplification, calculating the order of cycles in S_n becomes efficient, and allows for the illumination of various fresh properties and new ways to describe old properties. For future work, understanding the behavior of cycles in the symmetric groups, in particular the group S_3, can help provide insight into a connection with the "triangular periodic functions." The "triangular periodic functions" are developed by inscribing a triangle inside of a circle. Unpublished work by Lewis and Mickens give an explicit representation of the "triangular periodic functions." This research is supported by NSF LSAMP Award 1305041 and NSF Award 1700408.

6. Shakuan Frankson (Howard University) and Myka Terry (Morgan State University)

   Investigating First Returns: The Effect Of Multicolored Vectors

   Saturday from 10:30 AM – 11:00 AM

   By definition, a first return is the immediate moment that a path, using vectors in the Cartesian plane, touches the x-axis after leaving it previously from a given point; the initial point is often the origin. In this case, using certain diagonal and horizontal vectors while restricting the movements to the first quadrant will cause almost every first return to end at the point $(2n, 0)$, where $2n$ counts the equal number of up and down steps in a path.

   Using the first returns of Catalan, Schroder, and Motzkin numbers, which resulted from the lattice paths formed using a combination of diagonal and/or horizontal vectors, we investigated the effect that coloring these vectors will have on each of their respective generating functions.

7. Paige Helms (University of California at Riverside)

   $SL_2(\mathbb{Z})$ Action on Some Genus g Surfaces

   Friday from 3:00 PM – 3:30 PM

   The purpose of this research is to establish a lower bound for the number of orbits of the $SL_2(\mathbb{Z})$ action on Teichmüller space through an algebraic interpretation of minimally intersecting pairs of curves that fill a surface $\mathbb{S}_{g,0}$, of genus g with no boundary components or punctures. A minimally intersecting filling pair can be visualized on a square-tiling of a surface $\mathbb{S}_g$ that is also an origami, and so we call the surfaces characterized by the pair of curves a MIFPO. This structure gives us a way to examine the action of $SL_2(\mathbb{Z})$ on a given surface to determine if more than one orbit exists, and a way to calculate its monodromy group which gives us a lower bound for the number of orbits of the action.

   This problem is based off of recent wok by Aougab and Huang in 2013 in a paper called *Minimally Intersecting Filling Pairs on Surfaces*. Aougab and Huang establish a lower bound for the minimal algebraic and geometric intersection number of a pair of filling curves (α, β) on a surface $\mathbb{S}_g$ for $g \geq 2$ as $i(\alpha, \beta) = 2g - 1$; this bound is an equality for $g > 2$. We label $n = 2g - 1$ for convenience.

   My collaborators Tarik Aougab, Zichen Cui, Ajeet Gary, Tasha Jae Young Kim, Jenny Rustad, and I have generated experimental data using Matlab that shows the existence of exactly one orbit in $n = 5$, exactly four orbits in $n = 7$, exactly three orbits in $n = 9$, and at least two orbits in $n = 11$, all using the monodromy group for a MIFPO.

8. Maya Jones (Spelman College)

   Processing Speed as the Moderator in the Link Between Executive Functioning and Math Achievement

   Sunday from 9:00 AM – 9:30 AM

   Previous research indicates that processing speed is an important predictor for academic achievement. Processing speed is one of the main elements of cognition and is defined as the time it takes a person to do any mental task such as completing math problems, reading books, or taking notes. Although much is known about the relationship between processing speed and academic achievement, processing speed is commonly studied within populations of people with learning deficits and deficiencies. Although the links between processing speed and academic achievement have been established in the research literature, there is a significant need to establish some differentiation between the cognitive processes of overall academic achievement and math achievement in order to close the achievement gaps for children in the subject area of mathematics, particularly for African Americans. Research on African American children has often been done in comparison to Caucasian children and concludes that African American children are underperforming academically. The exclusive focus on African American children in the present investigation will allow us to identify cognitive factors that promote development, rather than identifying how African American children underperform compared to Caucasian children. Taking a quantitative approach for the proposed research is very important to advancing our understanding of processing speed and math achievement in order to examine the causal relationship between these two variables which have yet to be researched among African American children. It is hypothesized that processing speed will have a stronger association to math achievement when family income is used as a moderator variable. Implications are discussed in relation to the disparity of academic achievement among African American children and their Caucasian counterparts. This study aims to inform future research about how processing speed predicts math achievement among African American children using statistical modeling to perform data analysis.

9. Sofia Martinez Alberga (University of California at Riverside)

   E-Positivity and Uniqueness of Chromatic Symmetric Functions

   Saturday from 9:00 AM – 9:30 AM

   Properties of chromatic symmetric functions for specific graph classes have long been studied. One of the fundamental questions is whether a chromatic symmetric function uniquely determines a tree. This question was posed first by Stanley in 1995 and it remains an open problem, although it has been answered in the affirmative for a number of special classes of trees including caterpillars and spiders. Here we show the result holds for generalized spiders (i.e. line graphs of spiders) too, thereby extending the work of Martin, Morin and Wagner. A second fundamental question is whether a chromatic symmetric function is e-positive. Here we establish that certain classes of generalized spiders (i.e. those known as generalized nets) are not e-positive, and we use yet another class of generalized spiders to construct a counterexample to a conjecture involving the e-positivity of claw-free, P_4-sparse graphs, showing that Tsujie's result cannot be extended to this set of graphs. Finally, a fourth class of generalized graph, the generalized lollipop, is shown to be e-positive. This generalizes the work of Gebhard and Sagan and Cho and Huh.

Poster Abstracts

1. Mikaili Abdullah (Morehouse College) and DaLisa Nanelle Denham (Virginia State University)
   Chemovirotherapy

   Chemovirotherapy is a combination of chemotherapy, which is the use of anti-cancer drugs, and virotherapy, the use of biotechnology to convert viruses into therapeutic agents by reprogramming viruses to treat diseases. Alone, chemotherapy is considered an effective cancer treatment, but we believe the use of a hybrid chemo-viro treatment method will lead to a more successful treatment program than a single component treatment. In this paper, we study a mathematical model of tumor cell interactions. The proposed model consists of uninfected and infected tumor cells, an introduced virus, and a chemotherapeutic drug. Analysis is supplied for a controlled introduction of chemotherapeutic drug and virus. The model is described by a coupled system of nonlinear ordinary differential equations. The control function is the chemotherapeutic drug intervention. We aim to minimize both the drug dosage and the number of untreated tumor cells. We provide first-order necessary conditions for the optimal control and solve the optimal control problem numerically. Through our research, we discover that by optimizing the drug intervention and using a combination of the virotherapy and chemotherapy treatments, the tumor cells could be eliminated faster compared to stand-alone treatments and non-optimized drug intervention.

2. Lyric Bell (Spelman College) and Bhikhari Tharu (Spelman College)
   Statistical Modeling of AIDS Diagnosis of the USA by Ages

   For decades HIV and AIDS have remained as an issue for the United States and many other countries. While great progress has been made in preventing and treating HIV, there is still much to do. Considering that the disease HIV can lead to Acquired Immunodeficiency Syndrome (AIDS) if not treated, it is important to track the rate of AIDS in order to analyze the effectiveness in the current treatment and prevention methods. In my research, we explore the rate of AIDS diagnoses as either stationary, increasing or decreasing over time which tells us if the developing treatment towards that disease is overall effective or not. Things as such we attempt to convey through this research. We use simple linear regression method to model current data of AIDS diagnoses of men and women in 6 different age groups in order to predict the trend for upcoming years. We will use this trend to further investigate the rate of AIDS diagnoses amongst males and females in each age group. These trends may allow us to predict the rates of AIDS for the future (2017).

   Research Supported by NSF LSAMP.

3. Cahron Cross (Prairie State College)
   Jointly Ranked Prime-Reciprocal Sums and Natural Logarithms

   The aim of the research is to investigate the sequence generated by jointly ranking prime reciprocal sums up to the nth prime with $\ln(\ln(n))$. The location of the prime-reciprocal sums determine the numbers in the sequence. The objectives are to derive a formula for it and examine its characteristics, namely the differences between consecutive terms, and the differences between said differences. They will be referred to as "first differences" and "second differences".

4. Joel Goddot, III (Virginia State University) and Jasper Short, III (Virginia State University)
   Uniform stabilization of a nonlinear fluid-structure interaction model to a non-trivial equilibrium

   An important branch of control theory deals with finding the stability and non-stability of dynamic systems, such as fluid structure interactions. Fluid structure interaction occurs in many applications where the interaction between fluid surrounding or in a solid is at the heart of the matters. We obtain the following results: (1). using some mathematical methods and tools, such as multiplier's method, we prove the stabilizability of the coupled system to a non-trivial equilibrium via interior and/or boundary proportional feedback controls; (2) we verify these results by numerical simulation. In order to run the numerical simulation on this coupled system of partial differential equations (PDEs), we apply the finite element method. We will explore other feedback control mechanism, such as those with local actuation, in the future.

   Funding was provided by NSF/HBCU-UP grant HRD-1601127 to Yongjin Lu.

5. Samuel Hood (Morehouse College)

Tanh Activations in Image Classification

In machine learning, feature selection is important in being able to distinguish variables from each other. A subset of machine learning, deep learning, incorporates nonlinearity through activation functions – these functions allow us to transform an input signal from a node to an output signal for the next layer. Our work focuses on an exploration of features and activation functions in a variety of neural network architectures such as Convolutional Neural Networks and Auto-encoders. This lead us to study the hidden layers of a neural network on noisy imaging data. We are interested in the hidden layers because knowing how they function will help us in understand how a computer learns. In particular, we use linearization of activation functions in our models and compare training and test errors as well as the computational costs of each method. We incorporate noisy representations of MNIST data in our models into the input layer by adding Poisson noise. Poisson noise was used because the distribution of photons captured by medical devices closely mimics a Poisson distribution. We also include a variety of linearizations to investigate the differences of varying polynomial basis in our study. Approximating the activation functions with polynomials will allow us to gather further information regarding the nature of nonlinear activation functions.

6. Stephanie Obwar (Spelman College) and Bhikhari Tharu (Spelman College)

Disparities in College Enrollment in the USA by Gender and Race

According to studies made in USA, children of both sexes and races start school with roughly similar potential to learn. Their scores on IQ tests are approximately equivalent when gender difference was controlled. Yet, test scores of female students decrease over time until when children move up the ladder in the education arena. This implies that there are on-campus and off-campus factors that differently treat students across gender (Feldman, 1990). One of the highlighted reasons as to why this occurs is the glorification of the male group, which has been a problem throughout history. This deems them to be the best however in the recent years the male domination in the education sector has slightly dropped leading to gender disparity, which alludes to one sex being disadvantaged over the other in experiences and outcomes. Education disparities can be seen in different areas in the education sector such as the enrollment rates, dropout rates, and success rates among the sexes. Our research was focused on two main objectives, one was to study the trend in the enrollment rate and the disparities along the racial and gender lines and also the reason as to why there is a decline in the male enrollment. The research we conducted, explored the racial and gender disparities of college enrollment in the USA across all states, and collected our data from the National Center for Educational Statistics.

Regression analysis was used and results revealed that both gender and ethnicity variables are more likely to predict college enrollment rates. This quantitative research study will allow us to further understand the plausible predictors of the difference in college enrollment, which will be useful to eradicate the issue at hand. The results indicated that there was a significantly higher proportion of white students being enrolled in college compared to all the other races. We also observed that male enrollment was relatively lower compared to female enrollment in all the races. The regression formula that was used is useful in the prediction of college enrollment rates hence applied by legislators, school system personnel, education specialists, practitioners, and school system personnel to have a better understanding of which student groups have the greatest impact on enrollment rates and can tailor intervention strategies designed to help improve the enrollment rate.

7. Kessiena Ofunrein (Hampton University)

Statistical Analysis and Geographical Clustering of Los Angeles County Arrests

The work of the Los Angeles Police Department is something many sociologists and criminologists are intrigued by, but because of a lack of mathematical and statistical skills and clean, unbiased, and available data, their analysis is limited. In this study, I evaluated, interpreted, and analyzed a raw data set directly from the Los Angeles Police Department using advanced mathematical and statistical concepts. My work entailed visualizing multiple variables using graphs and clustering. This allowed me to build an understanding of who is being arrested in Los Angeles County and how their residence plays a role. I used three clustering methods to aggregate similar neighborhoods based on the types of crime people were arrested for. By understanding the trends of arrests and the distribution of variables in the data set, I conducted a unique analysis of the impact residence has on the arrested population of Los Angeles County. I hope to see this work lead to ways to prevent predictive policing from contributing to disparities and bias towards certain racial/ethnic groups and communities.

8. Chanae Ottley (Florida A&M University)
Using Social Media to Aid in Park Management

Over 17 million visitors visited Wisconsin's 42 state parks in 2016. While visitor statistics can be calculated at parks with gates or centralized entrances, collecting more detailed information can be costly or even impossible for parks without monitored entrances. For example, park managers can use surveys to learn about park visitors, but these surveys can be costly and have limited responses. We evaluated whether park management can benefit from using social media as a free survey system, because many visitors share their park experiences on social media sites (e.g., Twitter and Flickr). Furthermore, these sites can provide park managers insights that typical surveys would not. Both Flickr and Twitter provide their own application program interface (API) that allows the collection of geographical and textual information. With this information, we compared number of visits and visitors' opinions to different park attributes. We show that this method enables park managers to see how far visitors travel, the duration of their visit, and their opinions about the park. In turn, park managers can benefit from this free and detailed additional information social media provides about park users when making management decisions.

9. Marqus Parker (North Carolina A&T State University)
Multi-Constellational Global Navigation Satellite Systems (GNSS) RINEX Parser

GPS has transformed society and promises more sophisticated applications coming in the future. GPS is a component of Global Navigation Satellite Systems (GNSS) which contains other radio navigation satellite constellations. These include GLONASS, GALILEO, and BEIDOU, which are Russian, European Union (EU), and Chinese constellations respectively. In the near future, even the most common GNSS receivers will allow observers to obtain more accurate information and data from all constellations with an increased availability. Such advancements will be critical for more advanced applications. The purpose of this project was to create a software interface that will allow processing of the multi-constellational GNSS Receiver Independent Exchange Format (RINEX) files. RINEX is the standardized data format that contains information allowing for calculations of satellite positions and ranging information. These two informational components allow Position, Velocity, and Time (PVT) calculations to be executed by a satellite navigation system. To approach this project, a MATLAB code for the interface was implemented whose function was to parse RINEX files into ASCII files for all satellites constellations. Data from each constellation is included in the latest version of RINEX (3.03), and the parser developed was required to recognize appropriate data from each of these constellations. This script was implemented and executed to a large number of RINEX files from the NASA Space Geodesy Data archive website and it was found that the software interface was able to successfully able to retrieve navigation data from these RINEX 3.03 files.

10. Catherine Rono (Spelman College) and Bhikhari Tharu (Spelman College)
Disproportional College Enrollment in the USA by Race and Gender

The difference in college enrollment is a complex problem that can result from factors in all life domains. Despite the major reforms in the past decades, it is evident that we continue to find college enrollment gaps between different ethnicity groups. Specific factors commonly cited throughout literature in association with the college enrollment gaps include socioeconomic status, school mobility, and grade retention among others. There is also evidence suggesting that the factors influencing the decision to pursue higher education for minority students may differ from the factors that influence white students. This study examined differences in the total college enrollment between minority and non-minority status students.

We used regression analysis to predict the ethnicity and gender gap in college enrollment rates. A key finding that this research aimed to highlight is that the observed gaps in college enrollment rates among students from different ethnicities coexist with gender imbalances. This research is a vital part of identifying, monitoring, and addressing disparities in college enrollment among racial and ethnic minorities which will be used to establish specific policies, such as assistance programs for at-risk students. By identifying at-risk students, resources can be assigned efficiently to those students who would otherwise not pursue their college education level. We aim to further our research by identifying sources of disparities in college enrollment, as well as effectiveness of initiatives targeted to eliminate these disparities.

11. Joshua Sparks (Morehouse College)

Broken Mirrors: Exploring the Fragmentation of Identity in Mathematics Education Research

The purpose of this paper is to present the literature review on mathematics identity study that I conducted this summer. In this paper I talk about the importance of the definition of mathematics identity that Martin (2000) developed. In Martin's book he talks about mathematics identity and how it is more than just the determination of one's ability to do mathematics. Upon the creation of his definition of mathematics identity, he established that mathematics education researchers needed to do more than just take his definition and acknowledge the contextual factors that he talked about. These factors work together to help formulate mathematics identity in the same way that a mirror does for looking at oneself. This paper will provide analysis on how mathematics researchers are using the contextual factors that Martin describes in their studies to describe the successes and failures of African American students. Through this study, I find that there are scholars who use Martin's definition in an effective way, viewing mathematics identity as a complete picture, while there are others who fragment the mirror of identity resulting in an incomplete picture.

12. Lydia Wheatfall (Virginia State University)

Blueberries: Finding the antioxidant with near infrared spectroscopy

There is an urgent need to develop non-destructive, rapid, and economical procedures to determine polyphenolic content and anti-oxidation activity in fruits and vegetables. At present the determination of polyphenolic content and anti-oxidation activity is based on extraction of compounds from fruit samples and their analysis using complex chemical reactions. These determinations are often time-consuming, expensive, sample-wasting, labor-intensive, and produce environmentally hazard waste. We propose to utilize Near-Infrared (NIR) spectroscopy for measuring or predicting polyphenolic contents and/or anti-oxidation activity. This technique can be user-friendly and easily be used by farmers.

In this study, NIR spectroscopy is used to estimate the antioxidant and the blue, red, or violet pigmentation, which is called the anthocyanins in the blueberry fruit. This project will guide me in finding the solution to this problem. This includes how the blueberry fruit should be measured to avoid spreading the amount of antioxidant.

This estimation is needed to determine the measurement mode and measurement position to be examined. An example of this is the calyx, which means the membrane of protection. Blueberry fruit calyx content estimates were accurately found by choosing the mode and position of measurement for each target. The estimation of a fruit content by a model constructed from the spectra were found. This is where the PLS (Partial Least Square) Toolbox is used. PLS is a collection of essential and advanced Chemometric, which is a chemical analysis routine that's built within the MATLAB Computational environment. It contains the tools required by engineers and scientists to explore data and build predictive models. In conclusion, NIR spectroscopy is used to enable the blueberry fruit to be classified in terms of firmness and solid content, which intern allows increased sampling production and quality with accuracy of estimation.

13. Mack Williams (Xavier University of Louisiana)

Exploring Essential Transcription Factor Genes In Lymphoma Cell Lines to Understand Oncogene Enhancer Regulation

There are over 60 types of non-Hodgkin lymphomas(NHL), and diffuse large B-cell lymphoma (DLBCL) makes up approximately 30 percent of all lymphomas. B-cell lymphomas are cancers that arise from B-cells, a type of white blood cell that is required to produce antibodies. Gene enhancers are non-coding regions of a genome distal from gene promoter that are activated by transcription factors and regulate gene expression. Better understanding upstream transcription factors and proteins that are cancer related can lead to better treatments. The MYC gene has been identified as an essential gene in cancers as it drives growth. While MYC requires enhancers to be activated, different tissues require different enhancers to activate MYC. Utilizing CRISPRi screens allows for identification of essential transcription-factor binding modules within enhancer regions. However, identifying the transcription factors that bind and activate essential enhancers remains a challenge.

Previous NAM Undergraduate MATHFests

- MATHFest XXVIII: September 28 - 30, 2018 at Spelman College (Region A)
- MATHFest XXVII: September 29 - October 1, 2017 at Medgar Evers College (Region B)
- MATHFest XXVI: November 10-12, 2016 at Morgan State University (Region B)
- MATHFest XXV: October 29-31, 2015 at Morgan State University (Region B)
- MATHFest XXIV: Cancelled
- MATHFest XXIII: November 8-9, 2013 at Texas State University (Region C)
- MATHFest XXII: November 1-3, 2012 at Morgan State University (Region B)
- MATHFest XXI: November 3-5, 2011 at Dillard University (Region C)
- MATHFest XX: November 18-20, 2010 at Miami Dade College (Region A)
- MATHFest XIX: November 12-14, 2009 at the University of District of Columbia (Region B)
- MATHFest XVIII: November 13-15, 2008 at Texas Southern University (Region C)
- MATHFest XVII: November 8-10, 2007 at Spelman College (Region A)
- MATHFest XVI: November 9-11, 2006 at Howard University (Region B)
- MATHFest XV: November 10-12, 2005 at Texas Southern University (Region C)
- MATHFest XIV: October 7-9, 2004 at Morehouse College (Region A)
- MATHFest XIII: October 20 - November 1, 2003 at Delaware Statue University (Region B)
- MATHFest XII: October 2002 at Southern University of New Orleans (Region C)
- MATHFest XI: October 4-6, 2001 at Florida A&M (Region A)
- MATHFest X: October 26-28, 2000 at Morgan State University (Region B)
- MATHFest IX: October 21-23, 1999 at Texas Southern University (Region C)
- MATHFest VIII: October 21-23, 1998 at Benedict College (Region A)
- MATHFest VII: October 23-25, 1997 at Elizabeth City State University (Region B)
- MATHFest VI: October 24-26, 1996 at Xavier University (Region C)
- MATHFest V: October 26-28, 1995 at Clark Atlanta (Region A)
- MATHFest IV: October 13-15, 1994 at North Carolina A&T (Region B)
- MATHFest III: October 21-23, 1993 at Southern University (Region C)
- MATHFest II: March 18-20, 1993 at Spelman College (Region A)
- MATHFest I: November 1991 at Hampton University (Region B)

Save the Date:

Undergraduate MATHFest XXIX

September 27–29, 2019

Miami Dade College

Miami, Florida

MATHFEST XXVIII

SPELMAN COLLEGE

KATHERINE JOHNSON

Celebrating 100 years of life

Σ HARD WORK = SUCCESS

"Like what you do, then you will do your best."

-K. J.

National Association of Mathematicians, Inc.
Undergraduate MATHFest XXVIII

Friday, September 28 - Sunday, September 30
Spelman College

NAM's Undergraduate MATHFest is a three-day meeting which rotates around the country based on NAM's regional structure. It is held annually to encourage students to pursue advanced degrees in mathematics and mathematics education. The conference is geared for undergraduates from Historically Black Colleges and Universities (HBCUs), although all are welcome to attend. The conference consists of five components:

Student Talks
There will be ten talks given by undergraduate and graduate students which last 30-minutes each.

Poster Presentations
Students have the opportunity to present posters outlining their research.

Graduate Fair
Universities will have an opportunity to showcase their graduate programs and interact with undergraduate students in a two-hour fair.

Problem Time with Dr. Cooper
Throughout the conference, students will be presented challenge problems. Students with correct solutions will be presented prizes.

The J. Ernest Wilkins Lecture
This is an hour-long talk, given by an established researcher, to motivate our undergraduates to continue to pursue research in the mathematical sciences.

Funding is available for travel. To apply for funding, visit the conference website below.

2018 J. Ernest Wilkins Lecture
Michelle Craddock Guinn
Associate Professor of Mathematics
Belmont University

Golden Anniversary 2019
Founded 1969

Spelman College®
A Choice to Change the World

http://www.nam-math.org/mathfest.html#XXVIII

Name _____

www.TheTeachersCorner.net Printable Sudoku

Sudoku Puzzle

Fill in the grid with digits in such a manner that every row, every column and every 3x3 box accommodates the digits 1-9, without repeating any.

6	2			5				
8	3			7		9	4	2
			8		2		3	
2		4		6		8		3
					8			9
	8	6		3	7		2	
	9			2	1	3		6
3	6		9		5			4
	5						9	

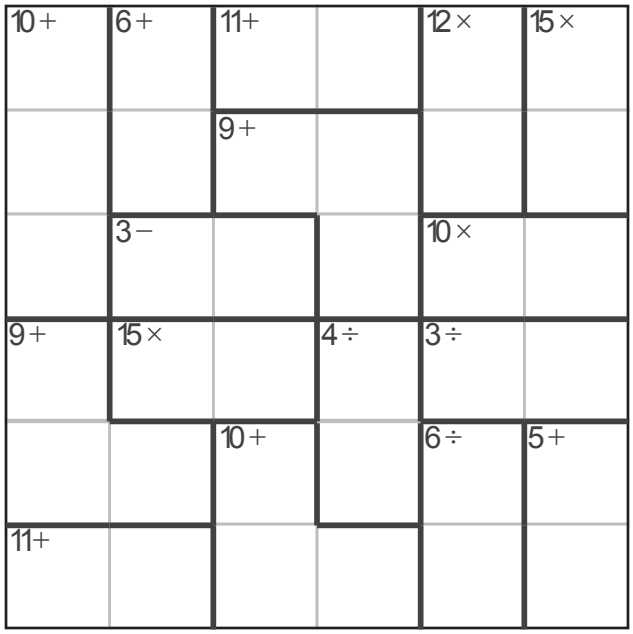
	1	5		8	2			9
	7		5		9			1
2							5	6
	4	2		9				7
7								2
6			2	1	7		4	3
9			7					8
1	5		8		6		9	
4				3		7	6	

	9	6		4	7	5		
8			9	6			3	
2						4		6
4		5	7	9			8	3
7	3		4			1		2
				5				
	7	4	8	2			6	1
	8	3			4			
			6			8	4	

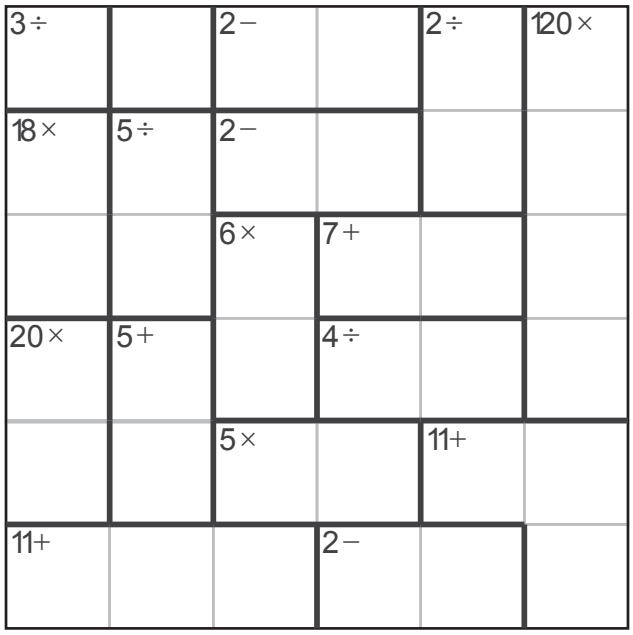
	6	3	8			1	2	
			3		9			7
	5	8		4		9		
		5			7	4		6
	4	7		8	3	2	9	
3			2					
	3		7	9		5	4	
2	8				1		7	
	7		4				8	

6 BY 6 MATHDOKU (MEDIUM NO. 1 AND 2)

FILL THE GRID WITH THE NUMBERS 1 TO 6 IN SUCH THAT EACH NUMBER APPEARS ONLY ONCE IN EACH ROW AND COLUMN. THE MATHDOKU GRID IS ALSO DIVIDED IN OUTLINED REGIONS CALLED CAGES EACH WITH A GIVEN OPERATOR AND TARGET NUMBER. THE NUMBERS IN THE INDIVIDUAL CELLS OF A CAGE MUST PRODUCE THAT TARGET NUMBER USING THE OPERATOR IN A MATHEMATICAL CALCULATION.



0606 MATHDOKU MEDIUM 1



0606 MATHDOKU MEDIUM 2

Name: _____

Human Scavenger Hunt!

Get to Know Your New Buddies

Has been out of the country:	Has a pet that isn't a dog or a cat:	LOVES SCIENCE:	Favorite subject is math:
Had a birthday within the last week:	Has visited Washington, D.C.	Has a brother or a sister that goes to this school:	loves to cook:
PLAYS A SPORT:	Favorite color is yellow:	Was born in another state:	Read more than 1 book this summer:
LOVES TO DRAW OR PAINT:	Has met someone famous	Has won a contest of some kind:	plays an instrument:
Has done something adventerous:	is an only child	Loves Broccoli	Has been to the Statue of Liberty:


13. Not Used
14. Packard Hall
15. Rockefeller Hall
16. Reynolds Cottage
17. Sisters Chapel
18. Read Hall
19a. Academic Computing Center
19b. Tapley Hall
19c. Albro-Falconer-Manley Science Center
20. Laura Spelman Hall
21. Morehouse-James Hall
22. Abby Aldrich Rockefeller Hall
23. Giles Hall
24. Milligan Building
25. The Suites
Spelman College
To Downtown Atlanta
20
NORTHSIDE DRIVE
SPELMAN LANE
CHAPEL STREET
Tennis Courts
"The Oval"
"The New Oval"
HENRY STREET
WESTVIEW DRIVE
LEE STREET
WEST END AVENUE
GREENSFERRY AVENUE
ENTRANCE
ENTRANCE
EXIT 55
Clark Atlanta University
RWWL
Morehouse College
350 Spelman Lane S.W.
Atlanta, GA 30314-4399
(404) 681-3643
www.spelman.edu
SPELMAN
ATLANTA
420
20
75
85
1. West Campus Parking Deck
Public Safety
2. Sally Sage McAlpin Hall
3. Dorothy Shepard Manley Hall
4. Howard-Harreld Hall
5. Donald and Isabel Stewart
Living & Learning Center I
6a. Johnnetta B. Cole
Living & Learning Center II
6b. LLC II Auditorium
7. Bessie Strong Hall
8. MacVicar Health Services
9. Manley College Center
9a. Bookstore/Post Office
10. Facilities Management & Services
11. Camille Olivia Hanks Cosby,
Ed D. Academic Center
12. Rockefeller Fine Arts Building
RWWL. Robert W. Woodruff Library
©Sketches, etc. 2008