GEORGIA STATE UNIVERSITY'S PERIMETER COLLEGE 32nd Annual Mathematics Conference



Friday and Saturday February 15-16, 2019

Clarkston Campus Student Center



32nd Annual Mathematics Conference Perimeter College at Georgia State University

February 15 – 16, 2019

Clarkston Campus

32nd Annual Mathematics Conference Perimeter College at Georgia State University

Conference Guest Speakers

Welcome

Dr. Nancy Kropf

Introduction of Speaker

Diana McGinnis Chairperson, Perimeter College Mathematics Conference

Keynote Address

Dr. Allison Wolf Lecturer University of Tennessee, Knoxville

About the Keynote Speaker

Allison Wolf earned a BA in mathematics at Macalester College and a PhD in mathematics with an emphasis in graph theory from Emory University. She spent time teaching mathematics at a variety of liberal arts colleges and computer science at Georgia Tech before finding the wonderful faculty and student body at what is now Perimeter College at Georgia State University. Dr. Wolf was a member of the 7th cohort of AMATYC's Project ACCCESS (Advancing Community College Careers: Education, Scholarship, and Service), where she studied the effects of "just in time" pre-requisite learning within the Calculus I environment.

Currently, Dr. Wolf is a lecturer at the University of Tennessee, Knoxville, where her teaching load focuses on the first two years of college, the Introduction to Mathematical Reasoning, and the Masters of Mathematics program, which is aimed at offering high school teachers a Master's degree consisting of courses relevant to what is taught in high school and the first two years of college. Her current research interests include responsive teaching techniques and active learning in the classroom environment.



Description of Keynote Address

Title: How to Know What the Students Don't Know: Experiments in Increasing Engagement

ABSTRACT: Any teaching requires making assumptions about what students do and do not know in an effort to connect them with new information. Active learning strategies can be used to uncover gaps in learning, but can also be frustrating for both students and instructors when there's a mismatch between our assumptions about what students know and the students' actual knowledge. Students disengage when they don't feel their needs are being met or when they're not learning new things. This talk will focus on Dr. Wolf's path to the use of responsive teaching techniques aimed at dealing with the mismatch of instructor and student expectations and at increasing student engagement.

Announcements

Evaluation Forms

Please complete an evaluation form for the conference, which can be found at our website, http://sites.gsu.edu/pc-gsu--mathconference/end-of-conference-survey/. We value your feedback and appreciate you taking the time to submit your comments!

Name Badge Holders

Please return your name badge holder to the registration table after you have attended your last conference event.

Parking

If you receive a parking ticket, turn it in at the registration table.

Handouts

Copies of handouts will be available online at the conference website <u>http://sites.gsu.edu/pc-</u> gsu--mathconference/

Thank you for attending! We hope that you enjoy the conference!

Thank you!

The Perimeter College Mathematics Conference Committee thanks the following for their contributions and generous support of the 32^{nd} Annual Perimeter College Mathematics Conference.

Cengage Learning Knewton Lumen Learning McGraw-Hill Education Pearson Top Hat

| Schedul | e at a | Glance |
|---------|--------|--------|
|---------|--------|--------|

| Friday, February 15, 2019 | | |
|-----------------------------|---------------------------------------|------------------------------------|
| Time | Event | Location |
| 8:00 AM | Registration Begins | CN building, 1 st floor |
| 8:30 AM | Hot Breakfast | CN-2220 |
| 9:00 AM - 10:45 AM | Full Sessions | CC and CA buildings |
| 10:55 AM | Welcome & Keynote Address | LRC - 1100 |
| 12:00 PM | Lunch | CN-2220 |
| 1:00 PM - 2:45 PM | Full Sessions | CC and CA buildings |
| 2:50 PM - 3:10 PM | Student Poster Exhibits and Snacks | CN-2220 |
| 3:15 PM - 4:30 PM | Mini Sessions | CC and CA buildings |
| 4:35 PM - 5:35 PM | GMATYC Meeting | CN-2240 |
| 5:40 PM | Dinner | CN building, 1 st floor |
| Saturday, February 16, 2019 | | |
| Time | Event | Location |
| 8:00 AM | Registration Begins | CN building, 1 st floor |
| 8:30 AM | Continental Breakfast | CN-2220 |
| 9:00 AM - 11:20 AM | Student Presentations | CD building |
| 11:30 AM - 1:00 PM | Lunch | CN-2220 |

Detailed Schedule

Friday, February 15, 2019

Full Sessions

| Session Time | CC – 1160 | CA – 1400 | CA - 1401 |
|--|--|---|--|
| 9:00 – 9:45 AM | 1. Hello Is anyone here? Old school and new school engagement strategies | 2. It's time to turn the cellphones on! | 3. The Mathematics of Bees and Beekeeping |
| 10:00 – 10:45 AM | 4. Exploring Volumes Using Geometry, Algebra, and Calculus | 5. An Effective and Efficient Way to Factor Trinomials | 6. New Co-Req Solutions with Mindset Emphasis |
| 10:55 AM | Keynote Add | ress: Dr. Allison Wol | f LRC - 1100 |
| | | | |
| 12:00 PM | | Lunch CN - 2220 | |
| 12:00 PM Session Time | CC-1160 | Lunch CN - 2220 CA-1400 | CA-1401 |
| 12:00 PM Session Time Wd 54:1 - 00:1 | CC-1160 7. Affordable, Accessible, Adaptive: Knewton's alta | Lunch CN - 2220 CA-1400 8. Acceleration and Intervention in Corequisite Courses | CA-1401 |

Snack, CN - 2220 and Student Poster Exhibits -Outside of CN - 2220

Friday, February 15, 2019

Mini Sessions

| Session Time | CC-1160 | CA-1400 | CA-1401 |
|----------------|---|--|--|
| 3:15 - 3:30 PM | A. I Didn't Know College was Going to Be This Hard! | B. Letters from our students | C. Infinity Wars: Convergent Sequences of Real and Complex Exponentials |
| 3:35 - 3:50 PM | D. Strategies for Teaching Word Problems in a College Algebra Course | E. Creating an Atmosphere of Fairness in the Mathematics Classroom | F. How tall is the campus library? |
| 3:55 - 4:10 PM | G. Use of the TI-84 to find zeros of higher order polynomials in College Algebra | H. Measuring Student Success | |
| 4:15 - 4:30 PM | I. The Time Thief - Multitasking | J. The Plickers Response System: A Quick and Effective Approach for Active Learning | |

| 4:35 - 5:35 PM | GMATYC Meeting Room CN-2240 |
|----------------|------------------------------------|
| 5.40 DM | Dinner |
| 5:40 PM | CN building, 1 st floor |

Detailed Schedule

Saturday, February 16, 2019

Student Sessions

| Time | Event | Location |
|---------|----------------------------|------------------------------------|
| 8:00 AM | Registration Begins | CN building, 1 st floor |
| 8:30 AM | Continental Breakfast | CN-2220 |

| Session Time | CD-1100 | CD-1120 |
|------------------|--|---|
| 9:00 - 9:20 AM | 1. Arduino Controlled Aquaponics Ecosystem | 2. Empirical Verification of Calculus: Using 3D Printing and Archimedes' Principle to Confirm Volumes of Solid Revolutions |
| 9:30 – 9:50 AM | 3. Calculus and the Colors of Night Sky | 4. Importance of Mathematical Induction and Applications |
| 10:00 - 10:20 AM | 5. A Brief History of Machine Learning | 6. The Arduino Car |
| 10:30 - 10:50 AM | 7. Number Slider Puzzle | 8. Matrices and Cryptography |
| 11:00 - 11:20 AM | 9. Apparatus to Measure a Tree | |

Abstracts for Full Sessions Friday, February 15, 2019

9:00 a.m. - 9:45 a.m.

1Hello... Is anyone here? Old school and new school engagement strategiesCC - 1160Keisha Brown, Perimeter College at Georgia State University, klanier1@gsu.edu

In this interactive session, participants will experience 15 different methods for engaging and assessing students. Attendees will be inspired to transform their classroom into active learning environments.

2 It's time to turn the cellphones on! CA - 1400 Rusandica (Sanda) Manole, Perimeter College at Georgia State University, <u>rmanole@gsu.edu</u> Co-presenter: Sharon Weltlich, Perimeter College at Georgia State University, <u>sweltlich@gsu.edu</u>

Are your students looking at their devices during class? Is this an indication that we should find other ways to engage them? Students prefer to learn in a way that is natural to them. The presenters will demonstrate three response systems that turn students' devices into active learning tools.

3 The Mathematics of Bees and Beekeeping CA - 1401 *Robert Pruvenok, Perimeter College at Georgia State University, <u>rpruvenok@gsu.edu</u> Honeybees are crucial pollinators for many flowering plant species and human food crops. This session will explore some of the mathematics of bees and beekeeping from the perspective of a*

session will explore some of the mathematics of bees and beekeeping from the perspective of a hobby apiarist.

Abstracts for Full Sessions Friday, February 15, 2019

10:00 am - 10:45 am

4 Exploring Volumes Using Geometry, Algebra, and Calculus *Thomas Cooper, University of North Georgia*, <u>tom.cooper@ung.edu</u>

This presentation will show how students can explore the volumes of geometric shapes through decompositions, algebraic computations, and in some cases Calculus. The presenter will use GeoGebra constructions and paper models that can be created by students. Shapes explored will include prisms, cones, pyramids, tetrahedra, frustums, and a burr puzzle.

5An Effective and Efficient Way to Factor TrinomialsCA - 1400Jonathan Joe, Middle Georgia State University, jonathan.joe@mga.eduCA - 1400<u>Co-presenter</u>: Lily Wang, Middle Georgia State University, lily.wang@mga.eduCA - 1400

We will present an effective and efficient approach to factor any trinomial regardless of its leading coefficient. As a result, neither the relatively complicated ac-method nor other timing consuming standard variations on the guess-and-check method are necessary to be used to factor trinomials with non-one leading coefficients.

6 New Co-Req Solutions with Mindset Emphasis C Calandra Davis, Pearson Education, <u>calandra.davis@pearson.com</u>

Join us to learn about new MyLab Math corequisite course solutions. In this session, we will cover best practices and tips for success in setting up corequisite courses designed to fit your school's needs and built to ensure successful implementation! Topics will include how to address student remediation, how to monitor student progress with course data analytics, and how to incorporate study skills, grit, and tools that foster a growth mindset. Also be the first to get a preview of new MLM features in development!

CA - 1401

CC-1160

Abstracts for Full Sessions

Friday, February 15, 2019

1:00 p.m. - 1:45 p.m.

7 Affordable, Accessible, Adaptive: Knewton's alta Dr. Aimee Berger, Knewton, <u>aimee@knewton.com</u>

Utilizing OER content and a sophisticated adaptive engine, Knewton's alta courseware provides a uniquely personal experience for learners, demonstrably effective for addressing the needs of students at all levels. It also creates unique opportunities for instructor-student engagement, and can be leveraged, alone or in conjunction with campus resources, to support students who struggle to meet learning objectives of curriculum courses.

8 Acceleration and Intervention in Corequisite Courses CA - 1400 Kate Wise, Hawkes Learning, <u>iboyd@hawkeslearning.com</u>

Actively engage students in corequisite courses with mastery-based learning, incorporation of study skills, and new worktexts. See how reporting & analytics can help instructors identify at-risk students and pinpoint the most commonly missed questions on assessments, allowing for more tailored classroom instruction and increased student motivation to learn.

2:00 p.m. - 2:45 p.m.

9 OHM: Fully Customizable Math Solution with Full LMS Integration CC - 1160 powered by High Quality OER

Chris Holder, Lumen Learning, chris.holder@lumenlearning.com

Changing course materials can be time consuming, but not with OHM. Template courses can be easily customized to meet your instructional needs. Come see how quickly you can adopt OHM with algorithmically generated problems and seamless LMS integration for just \$25 per student

| 1 Using Ink2Go to Create Video Presentation | 15 |
|---|----|
|---|----|

0 Robby Williams, Perimeter College at Georgia State University, jwilliams345@gsu.edu

This session will introduce how to use the recording and annotation features in Ink2Go to create video examples. It will also cover how to upload videos into Kaltura, post them in D2L, and how to request and edit closed captioning in Kaltura.

CC-1160

CA - 1400

Abstracts for Student Posters

Friday, February 15, 2019

2:50 p.m. - 3:10 p.m.

Arduino Controlled Aquaponics Ecosystem

Megan A Kilinski, Georgia State University - Perimeter College, <u>mkilinski1@student.gsu.edu</u>

Megan Kilinski will present her micro-controller operated aquaponics system. The presentation will consider mathematical principals, e.g. flow rate and electric current, behind this symbiotic system. She will discuss the code written to control the electronic components and chemical reactions that convert ammonia from fish waste into bioavailable nitrogen for plants.

Mandelbrot Set Map

Milo Vasquez, Georgia State University - Perimeter College, <u>milo.vas@gmail.com</u>

A detailed map of the Mandelbrot Set function illustrated as a mapped island. Exploring the intricacies of the function by entertaining the imagination.

Abstracts for Mini Sessions Friday, February 15, 2019

3:15 p.m. - 3:30 p.m.

I Didn't Know College was Going to Be This Hard! A. Lynda Cain, Perimeter College at Georgia State University, <u>lcain3@gsu.edu</u>

In this collaborative session, the presenter will share a recent experience in which one of her firstyear college students told her that she had no idea COLLEGE WAS GOING TO BE THIS HARD! As a result of the student's comment, the presenter decided to explore why many firstyear students find college challenging. She will share her findings, feedback from students, and suggested resolutions. The presenter welcomes session attendees' perspectives and experiences related to teaching first-year college students.

B. CA - 1400Letters from our students Dihema Longman, Perimeter College at Georgia State University, dlongman1@gsu.edu

The ball is in the student's court for them to share with other students their experiences taking online mathematics class. This presentation discusses the top 10 suggestions that students from past semesters offer to current students about taking an online mathematics class.

C. **Infinity Wars: Convergent Sequences of Real and Complex Exponentials** CA - 1401

David Vogel, Middle Georgia State University, <u>david.vogel@mga.edu</u>

Co-presenter: Jonathan Joe, Middle Georgia State University, Jonathan.joe@mga.edu

Infinite sequences of exponentials, such as x, x^x , x^x , x^x , x^x , x^y , ... are examined. It is clear that the sequence diverges for x = 2 or larger. We investigate convergence for values of x in the range from 0 to 2 and find some interesting values. Then we consider exponential sequences of complex numbers, such as i, i^{i} , $i^{(i^{i})}$, ...

CC - 1160

Abstracts for Mini Sessions Friday, February 15, 2019

3:35 p.m. - 3:50 p.m.

D. Strategies for Teaching Word Problems in a College Algebra Course CC - 1160

Abby Noble, Middle Georgia State University, abby.noble@mga.edu

"Two trains leave a station at the same time." Those words cue math anxiety in many College Algebra students, even some of those who are doing quite well! This presentation offers alternate student-approved approaches for solving these and similar types of word problems. We will bypass the standard instructions to "fill out this table" and instead focus on diagrams and equations with words.

E.Creating an Atmosphere of Fairness in the Mathematics ClassroomCA - 1400Paula H Krone, Esq, Georgia Gwinnett College, pkrone@ggc.edu

What does it mean to be fair when it comes to grading? What fairness means to you may not be what it means to your students. What fairness means to you or to your students may not be what it means to the law. This session will briefly examine how we calculate grades and how our methodology might be viewed by outsiders should it ever come under scrutiny. This session is meant to have attendees come away with thoughtful self-reflection when calculating or otherwise assigning grades.

F. How tall is the campus library?

Sarah Park, Georgia Gwinnett College, <u>spark3@ggc.edu</u>

The presenter will share an engaging class activity for a precalculus course that involves students "measuring" an actual building using trigonometry, a clinometer app, measuring tape, straw and some chalk. This lesson takes place outside on campus so students can apply the trigonometry they learned in class and have fun

CA - 1401

Abstracts for Mini Sessions Friday, February 15, 2019

3:55 p.m. – 4:10 p.m.

G. Use of the TI-84 to find zeros of higher order polynomials in College CC – 1160 Algebra

Lee Clendenning, University of North Georgia, lee.clendenning@ung.edu

The TI-84 is a very useful tool find zeros of higher order polynomials in College Algebra. This presentation will demonstrate the use of the TI-84 to find zeros of higher order polynomials as an aid to students in factoring them. Example assignments will be shown.

H. Measuring Student Success

Robert Blumenthal, Georgia College, robert.blumenthal@gcsu.edu

In this presentation, I want to offer some words of caution regarding the use of the DWF-rate as a measure of student success. There are a number hidden variables within this statistic which can greatly influence its meaning. It is important to isolate these hidden variables before drawing any firm conclusions.

4:15 p.m. - 4:30 p.m.

I. The Time Thief - Multitasking

Erin Church, Perimeter College at Georgia State University, <u>ecooke@gsu.edu</u>

While it is quite popular and even praised, multitasking is not effective. Learn some of the interesting facts about multitasking and why it is better to do things one at a time.

J. The Plickers Response System: A Quick and Effective Approach for Active CA - 1400 Learning

Michael Hammock, Middle Georgia State University, <u>michael.hammock@mga.edu</u>

The Plickers Response System is a cost effective version of the Clickers Response System. This response system will allow professors to evaluate student performance quickly while they are actively engaging in class. Both professors and students will be able to quickly identify strengths and weaknesses in the class.

00 110

CA - 1400

CC - 1160

Abstracts for Student Presentations Saturday, February 16, 2019

9:00 a.m. - 9:20 a.m.

1. Arduino Controlled Aquaponics Ecosystem CD – 1100 Megan A Kilinski, Georgia State University - Perimeter College, mkilinski1@student.gsu.edu

Megan Kilinski will present her micro-controller operated aquaponics system. The presentation will consider mathematical principals, e.g. flow rate and electric current, behind this symbiotic system. She will discuss the code written to control the electronic components and chemical reactions that convert ammonia from fish waste into bioavailable nitrogen for plants.

2. Empirical Verification of Calculus: Using 3D Printing and Archimedes' CD – 1120 Principle to Confirm Volumes of Solid Revolutions

Jessica Rene' Johnson and Farid Hudda, Georgia State University Perimeter College

<u>Faculty Advisor</u>: Somaya Muiny, Georgia State University - Perimeter College, <u>smuiny1@gsu.edu</u>

We aim to verify the application of calculus in calculating volumes of solids of revolution. We will 3D print shapes defined by rotating an area bounded by a graph around a line or axis, then we will compare the theoretical volume calculated using the disk or washer method to the empirical volume measured using Archimedes' Principle.

9:30 a.m. - 9:50 a.m.

3. Calculus and the Colors of Night Sky

Saina Ahmadpour / Cheick Dosso, Perimeter College at Georgia State University

<u>Faculty Advisor</u>: Somaya Muiny, Georgia State University - Perimeter College, <u>smuiny1@gsu.edu</u>

Did you ever wonder what causes the beautiful shades in the night sky? The bright stars that fill our sky are in fact blue and red. You may ask what causes a star to radiate these two colors. In this presentation, we will answer this question and show you how to use Taylor series and limits to learn more about the nature of the stars.

4. Importance of Mathematical Induction and Applications

CD – 1120

Chi Luong, Perimeter College at Georgia State University, <u>cluong@student.gsu.edu</u>

<u>Faculty Advisor</u>: Somaya Muiny, Georgia State University - Perimeter College, <u>smuiny1@gsu.edu</u>

Mathematical induction is a mathematical proof technique, typically used to establish that a given statement is true for all natural numbers (non-negative integers). It is so important because it can be used to prove not only in arithmetic but also in geometry and design of algorithm.

CD – 1100

CD-110

Abstracts for Student Presentations Saturday, February 16, 2019

10:00 a.m. - 10:20 a.m.

5. A Brief History of Machine Learning

Hoang Huynh, Perimeter College at Georgia State University, <u>hhuynh18@student.gsu.edu</u> <u>Faculty Advisor</u>: Diana McGinnis, Georgia State University - Perimeter College, <u>dmcginnis@gsu.edu</u>

In the last century, electricity transformed every major industry of society. With improvements in algorithms and computer power, Artificial Intelligence (AI) has the potential to create an equally significant transformation. Machine Learning (ML) is one of the driving forces behind AI. The presenter will discuss the major developments of ML.

6. **The Arduino Car**

Ahmad Faeq, Perimeter College at Georgia State University, <u>afaeq1@student.gsu.edu</u> <u>Co-presenter:</u> Christopher Ballenger, <u>cballenger1@student.gsu.edu</u>

This presentation is going to be about demonstration of a developed Arduino car that can sensor and feel colors under it. Our idea is about something that can be applied in the cars we drive in the future, where the cars can be self-driven based on the colors they read on the streets.

10:30 a.m. - 10:50 a.m.

7. Number Slider Puzzle

Madina Bah, Perimeter College at Georgia State University, <u>mbah14@student.gsu.edu</u> <u>Faculty Advisor</u>: Dr. Sahythya Reddivari, <u>sreddivari@qsu.edu</u>

The Nine Number Sliding Puzzle was created using Java and CSS. A recursive algorithm scrambles the tiles by picking a random combination of moves. The algorithm is designed to provide hints by using brute force to visit all possible combinations and return a sequence of moves that solves the puzzle.

8. Matrices and Cryptography

Chi Luong, Perimeter College at Georgia State University, cluong@student.gsu.edu

Cryptography, to most people, is concerned with keeping communications private. It is known as encryption and decryption to keep the message is secret. There are a lot of methods which have been used. In some cases, national security agencies use matrices as key to

protect data or messages.

11:00 a.m. - 11:20 a.m.

9. Apparatus to Measure a Tree

Hao Nguyen, Perimeter College at Georgia State University, <u>hnguyen175@student.gsu.edu</u> <u>Co-presenter</u>: Christopher Hichez, Perimeter College at Georgia State University Faculty Advisor: Dr. Sahythya Reddivari, sreddivari@gsu.edu

We are building a device to measure the height of a tree (or a very tall object). We plan to use the Arduino platform to shoot a light beam and measure the time between the transmitted beam and received beam to calculate the distance

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CD - 1120

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CD – 1100

Notes

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| (| English |
| | International student and scholar Services/Admissions |
| | Mathematics |
| | MESA |
| information. | Military Outreach Center |
| | Nursing |
| Foreign Language/E>L | The student mealth Center 🗸 |
| Mail Koom | TelO - Inverter |
| CB | |
| Business/Social Science | C |
| Disability Services | Nursing |
| Learning & Tutoring Center | ī |
| Student Development and | |
| Special Programs | rolice Department Communications |
| Student Media | CL |
| TRIO – Student Support Service | CAT (Greation and Technology) |
| Upward bound | Lab/Computer Lab |
| CC | JCLRC - Jim Cherry Auditorium |
| DECA - Dekalb Early | LIDTARY |
| College Academy | |
| Move On When Ready | CM |
| (Dual Enrollment) | Facilities Operations |
| Science | Facilities Planning & Projects |
| CD | Surplus Warehouse |
| Amorican Sign Janguago | |
| Auterican Jugit Language | |
| DECA Datale Education | Admissions |
| Collors Assistant | |
| | |
| | |
| CE | |
| English | Center for International Education? Study Abroad |
| Honors College | Center for Excellence in Teaching |
| Humanities | and Learning |
| CF | Deans of Academics and Students |
| Fine Arts and Humanities | Enrollment Services |
| Marvin Cole Auditorium | Financial Services |
| (Use south entrance.) | Military Resource Booth |
| Pedia Design Lab | Personal Counseling Services |
| | |
| (Use north entrance.) | |
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| Gymnasium 👽 | CS |
| Receational Services | Auxiliary Services |
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| | Mail Services |
| Weight Room | PawPrints (Printing Services) |
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CLARKSTON CAMPL

Welcome to the

Rev: 07/16



32nd Annual Mathematics Conference Perimeter College at Georgia State University

| Social Media Coordinator | Nikita Patterson |
|-------------------------------|------------------|
| Saturday Sessions Coordinator | . Somaya Muiny |

| rechnology CoordinatorStephanie Garolalo |
|---|
| Program CompilerJoanna Wilson, Avi Kar |
| Nametag CoordinatorKeisha Brown |
| Preparedness CoordinatorMohammad Aslam, Emily Whaley |
| Budget ManagerKouok Law |
| Presiders/Certificates Coordinator Erin Church |
| |

Parallel Sessions Coordinator.....Nikita Patterson

