

# 2019 AWM Research Symposium Schedule

## Rice University, Houston Texas

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### Friday, April 5, 2019

5:00-8:00pm **Informal Opening Reception**  
Outside Valhalla Hall | Rice University

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### Saturday, April 6, 2019

8:00-8:30am **Registration and Continental Breakfast** (Duncan Hall)

8:30-8:45am **Welcoming Remarks:** Ruth Haas, AWM President, and Ami Radunskaya, AWM Past-President (McMurtry Auditorium, Duncan Hall)

8:45-9:30am **Plenary Lecture:** Chelsea Walton, University of Illinois  
*Title: Quantum Symmetry*  
*Location: McMurtry Auditorium, Duncan Hall*

9:30-10:15 **Exhibits and Coffee** (Martel Atrium, Duncan Hall)

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10:15-12:15 **Research Sessions (expanded below)**  
ACxx: Women in Algebraic Combinatorics, I (Keck 105)  
Analysis and Numerical Methods for Kinetic Transport and Related Models, I (Duncan Hall 1046)  
Applied and Computational Harmonic Analysis, I (Duncan Hall 1075)  
Combinatorial Commutative Algebra, I (Hermann Brown 227)  
WICA: Women in Commutative Algebra, I (Herzstein 212)  
Education Partnerships: University Mathematics Faculty and K-12 Mathematics Teachers (Herzstein 210)  
New Advances in Symplectic and Contact Topology, I (Hermann Brown 423)  
Topology of 3- and 4-Manifolds, I (Hermann Brown 427)  
WIC: Women in Control, I (Duncan Hall 1042)  
WIMM: Women in Mathematics of Materials, I (Herzstein 211)  
WINASC: Women in Numerical Analysis and Scientific Computing, I (Duncan Hall 1064)  
WinCompTop: Women in Computational Topology, I (Keck 100)  
WINART: Women in Noncommutative Algebra and Representation Theory, I (Keck 107)  
WIN: Women in Numbers, I (Herman Brown 453)

WiSh: Women in Shape Modeling, I (Keck 101)  
WISDM, Data Science: Theory and Practice, I (Mech Lab 251)  
WIT: Women in Topology, I (Mech Lab 254)

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12:15-1:30pm **Lunch Break** Box lunches provided in Martel Atrium, Duncan Hall

12:30-1:15pm [Learn about AWM ADVANCE Research Networks](#), Kristin Lauter and Magnhild Lien (Duncan Hall 1070)

1:30-2:30pm **Concurrent Presentations**

**Mathematicians in Government and Industry Panel**, McMurtry Auditorium  
Sarah Charlton, Applied Research Mathematician, NSA  
Veronica Lino, Full-Stack Immersive Instructor, DigitalCrafts  
Jennifer Pearl, Science & Technology Policy Fellows Director, AAAS  
Wenting Xiao, Research Engineer, ExxonMobil  
*Moderated by Karoline Pershell, Executive Director, AWM*

[DMS Funding Opportunities](#), Duncan Hall 1064  
Yuliya Gorb, Program Director, Computational Mathematics, NSF

2:30-3:15pm **Posters, Exhibits, and Coffee** available in Martel Atrium, Duncan Hall

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3:15-5:15pm **Research Sessions (expanded below)**

Applied and Computational Harmonic Analysis, II (Duncan Hall 1075)  
Braid Groups and Quantum Computing (Herzstein 210)  
Combinatorial Commutative Algebra, II (Hermann Brown 227)  
WICA: Women in Commutative Algebra, II (Herzstein 212)  
New Advances in Symplectic and Contact Topology, II (Hermann Brown 423)  
New Developments in Algebraic Biology, I (Mech Lab 251)  
Topology of 3- and 4-Manifolds, II (Hermann Brown 427)  
Women in Data Science, I (Duncan Hall 1070)  
WIC: Women in Control, II (Duncan Hall 1042)  
WIG: Women in Geometry, I (Mech Lab 254)  
WIMB: Women in Math Biology, I (Keck 105)  
WIMM: Women in Mathematics of Materials, II (Herzstein 211)  
WIN: Women in Numbers, II (Herman Brown 453)  
WINASC: Women in Numerical Analysis and Scientific Computing, II (Duncan Hall 1064)  
WinCompTop: Women in Computational Topology, II (Keck 100)  
WiSh: Women in Shape Modeling, II (Keck 101)

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5:30-6:15pm **Plenary Lecture:** Susanne C. Brenner, Louisiana State University  
*Title: [Higher Order Elliptic Problems](#)*  
*Location: McMurtry Auditorium*

6:30-7:15pm **Wine Reception and Networking** Brochstein Pavilion  
7:15-9:15pm **Banquet**, Student Center Grand Hall  
**Welcome:** Provost Marie Lynn Miranda, Rice University  
**Keynote Speaker:** Mariam Manuel, University of Houston

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## Sunday, April 7, 2019

8:00-8:30 **Registration and Continental Breakfast** (Duncan Hall)

8:30-8:45 **Opening Remarks**

8:45-9:30 **Poster Session II, Exhibits, and Coffee** (Martel Atrium, Duncan Hall)

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9:30-11:30 **Research Sessions (expanded below)**

ACxx: Women in Algebraic Combinatorics, II (Keck 105)

Analysis and Numerical Methods for Kinetic Transport and Related Models, II (Keck 100)

Combinatorial Algebra (Herman Brown 423)

Current Challenges in Mathematical Biology (Herzstein 212)

Graph Theory (Duncan Hall 1046)

Math on the EDGE (Herman Brown 227)

Multiphysics and Multiscale Problems (Duncan Hall 1042)

New Developments in Algebraic Biology, II (Mech Lab 251)

On Advances and New Techniques of Fluid Dynamics and Dispersive Equations (Duncan Hall 1064)

Origami, Belyi Maps, and Dessins D'Enfants (Herzstein 211)

Recent Developments in the Analysis of Obstacle Problems Associated to Nonlocal Operators (Duncan Hall 1075)

Women in Data Science, II (Herzstein 210)

Wikipedia Edit-a-Thon (McMurtry Auditorium, Duncan Hall)

WIMB: Women in Math Biology, II (Keck 107)

WIG: Women in Geometry, II (Herman Brown 427)

WINART: Women in Noncommutative Algebra and Representation Theory, II (Herman Brown 453)

WISDM: Data Science Theory and Practice, II (Keck 101)

WIT: Women in Topology, II (Mech Lab 254)

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11:30-11:45 **Exhibits and Coffee Break** (Martel Atrium, Duncan Hall)

11:45-12:30

**Plenary Lecture:** Kristin Lauter, Microsoft

*Title:* [How to Keep Your Secrets in a Post-Quantum World](#)

*Location:* McMurtry Auditorium

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## Exhibits at the Research Symposium

Please visit the AWM Exhibitors in Duncan Hall throughout the Symposium to learn more about these programs and opportunities.

500WomenScientists.org  
The American Association for the Advancement of Science (AAAS)  
The American Mathematical Society (AMS)  
AWM's ADVANCE Grant and Research Collaboration Networks  
The Caucus for Women in Statistics\* (CWS)  
Crocheted Topological Surfaces by Moira Chas  
The Dana Center  
Enhancing Diversity in Graduate Education (EDGE)  
Expand Your Horizons  
The Heidelberg Laureate Forum Foundation  
The Institute for Advanced Study (IAS)  
The Mathematical Association of America (MAA)  
The National Association for Mathematicians (NAM)  
National Security Agency (NSA)  
MAA's Project NExT  
Rice University School Mathematics Project (RUSMP)  
Society for Industrial and Applied Mathematics\* (SIAM)  
Springer Books  
The Tapia Conference  
TODOS \*  
Women in Math Education\*

\* As partner organizations, they will have materials on hand so that the AWM community can learn about the important work they do.

**Please Visit the *Remembering Maryam Mirzakhani* Exhibition in the River Hallway.** This exhibit was shown for the first time at the World Meeting for Women in Mathematics in Rio on 31 July 2018 as well as during the International Congress of Mathematicians (ICM2018) which immediately followed. The exhibition was created by the International Mathematical Union's Committee for Women in Mathematics (CWM) with Curator Thais Jordao and Designer Rafael Meireles Barroso and consists of 18 posters.

# Breakout Research Sessions

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## Saturday, April 6, 2019. Morning Sessions (10:15 - 12:15)

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**WIN: Women in Numbers** Organizers: Michelle Manes and Ila Varma, Hermann Brown 453

- 10:15-10:35 Min-Joo Jang. [Quantum Modular Forms And Singular Combinatorial Series](#)  
10:45-11:05 Christelle Vincent. [Computing Hyperelliptic Modular Invariants From Period Matrices](#)  
11:15-11:35 Jiuya Wang. [Inductive Method In Counting Number Field](#)  
11:45-12:05 Alina Bucur. [Statistics For Points On Curves Over Finite Fields](#)

**WinCompTop: Women in Computational Topology** Organizers: Erin Chambers, Brittany Terese Fasy, Elizabeth Munch, Keck 100

- 10:15-10:35 Sara Kalisnik Verovsek. [Learning Algebraic Varieties From Samples](#)  
10:45-11:05 Rachel Neville. [Topological Techniques For Characterization Of Pattern Forming Systems](#)  
11:15-11:35 Michelle Feng.  
11:45-12:05 Violeta Kovacev-Nikolic. [Visual And Statistical Comparison Of Simplicial Complexes](#)

**ACxx: Women in Algebraic Combinatorics**, Organizers: Elizabeth Niese, Elizabeth Drellich, Keck 105

- 10:15-10:35 Heather Russell. [Comparing The Web And Specht Bases For Symmetric Group Representations](#)  
10:45-11:05 Anna Weigandt. [Bumpless Pipe Dreams And Alternating Sign Matrices](#)  
11:15-11:35 Bridget Eileen Tenner. [Enumerations In Coxeter Groups](#)  
11:45-12:05 Sarah Bockting-Conrad. [Tridiagonal Systems Of Racah Type](#)

**WINASC: Women in Numerical Analysis and Scientific Computing** Organizers: Bo Dong, Adrianna Gillman, Duncan Hall 1064

- 10:15-10:35 Annalisa Quaini. [A Computational Study Of Lateral Phase Separation In Biological Membranes](#)  
10:45-11:05 Beatrice Riviere. [Numerical Methods For Solving Linear Poroelasticity Equations](#)  
11:15-11:35 Lise-Marie Imbert-Gerard. [Integral Equation Methods For Acoustics In Smoothly Varying, Anisotropic Media](#)  
11:45-12:05 Karin Leiderman. [A Density-Dependent FEM-FCT Algorithm With Application To Modeling Platelet Aggregation](#)

**WINART: Women in Noncommutative Algebra and Representation Theory**, Organizers: Van C. Nguyen, Julia Plavnik, Sarah Witherspoon, Keck 107

- 10:15-10:35 Khrystyna Serhiyenko. [\*Mutation Of Type D Friezes\*](#)  
10:45-11:05 Lauren Grimley. [\*Deformations Of Quantum Complete Intersections\*](#)  
11:15-11:35 Elizabeth Wicks. [\*Frobenius-Perron Theory Of Modified ADE Bound Quiver Algebras\*](#)  
11:45-12:05 Gordana Todorov. [\*Cyclic Posets And Triangulation Clusters\*](#)

**WiSh: Women in Shape Modeling**, Organizers: Kathryn Leonard, Terry Knight, Keck 101

- 10:15-10:35 Athina Panotopoulou. [\*Scaffolding A Skeleton\*](#)  
10:45-11:05 Theodora Vardouli. [\*Shapes Beyond Structures\*](#)  
11:15-11:35 Ilke Demir. [\*On The Importance Of Shape Representations For Deep Learning\*](#)  
11:45-12:05 Geraldine Morin. [\*Representation And Distribution Of 3D Shapes And Environments\*](#)

**WIT: Women in Topology** Organizers: Sarah Yeakel, Martina Rovelli, Mech Lab 254

- 10:15-10:35 Agnes Beaudry. [\*Picard Groups And Orientability\*](#)  
10:45-11:05 Eva Belmont. [\*Mahowald Invariants And The R-Motivic Adams Spectral Sequence\*](#)  
11:15-11:35 Safia Chettih. [\*Configurations With Sinks And On Graphs\*](#)  
11:45-12:05 Brittany Terese Fasy. [\*Directed Homotopy Collapses\*](#)

**WIC: Women in Control** Organizers: Lorena Bociu, Irena Lasiecka, Duncan Hall 1042

- 10:15-10:35 Suzanne Lenhart. [\*Optimal Control Applied To Management Of Fishery Models\*](#)  
10:40-11:00 Weiwei Hu. [\*Second Order Optimality Conditions For Boundary Control Of Optimal Mixing Via Fluid Flows\*](#)  
11:05-11:25 Luz De Teresa. [\*Some Hierarchic Control Problems For The Heat Equation\*](#)  
11:30-11:50 Valeria Neves Domingos Cavalcanti. [\*Uniform Stability For The Wave Equation With Localized Memory\*](#)  
11:55 – 12:15 Yulia Gorb. [\*Singular behavior of the gradient of the solution to high contrast PDEs\*](#)

**WIMM: Women in Math Materials**, Organizers: Malena Espanol, Hala AH Shehadeh, Herzstein 211

- 10:15-10:35 Lidia Mrad. [\*Chromonic Liquid Crystals And Applications To Modeling DNA In Free Solution\*](#)  
10:45-11:05 Silvia Jimenez Bolanos. [\*Materials Science And Differential Geometry\*](#)  
11:15-11:35 Xingjie Helen Li. [\*Bending Admissible Blended Force-Based Coupling Method For Single-Layered 2D Crystal\*](#)

11:45-12:05 Ling Xu. [On The Viscous Lamb Dipole](#)

**WISDM: Women in the Science of Data and Mathematics** Organizers: Linda Ness, Carlotta Domeniconi, Mech Lab 251

10:15-10:35 Carolyn Mayer. [Erasure Coding Techniques For Content Download](#)

10:45-11:05 Anna Ma. [A Dynamic Sampling Approach To SKM Method](#)

11:15-11:35 Karamatou Yacoubou-Djima. [Heuristic Framework For Multi-Scale Testing Of The Multi-Manifold Hypothesis](#)

11:45-12:05 Yang Chen. [Calibration Concordance For Astronomical Instruments Via Multiplicative Shrinkage](#)

**Analysis and Numerical Methods for Kinetic Transport and Related Models**, Organizer: Liu Liu, Duncan Hall 1046

10:15-10:35 Kit Newton. [Two-Level Markov Chain Monte Carlo Methods For The Inverse Radiative Transfer Equation](#)

10:45-11:05 Liu Liu. [Micro-Macro Decomposition Based Asymptotic-Preserving Schemes And Moments Conservation For Collisional Kinetic Equations](#)

11:15-11:35 Anna Szczekutowicz. [Velocity Dependent Coulomb Logarithm In The Landau Limit Of The Boltzmann Equation](#)

11:45-12:05 Milana Pavic-Colic. [Some Analytical Aspects For The Boltzmann System Of Monatomic Gas Mixtures: The Cauchy Problem, Generation And Propagation Of Polynomial And Exponential Moments](#)

**Applied and Computational Harmonic Analysis**, Organizers: Julia Dobrosotskaya, Xuemei Chen, Duncan Hall 1075

10:15-10:35 Emily J King. [Edge, Ridge, And Blob Detection With Symmetric Molecules](#)

10:45-11:05 Jing Qin. [High-Resolution Fluorescence Microscopy Image Deconvolution](#)

11:15-11:35 Yi Wang. [ConceFT: Concentration Of Frequency And Time Via A Multitapered Synchrosqueezed Transform](#)

11:45-12:05 Ronrong Wang. [A Simple Nonlinear Dimension Reduction Technique For High Dimension Data Visualization](#)

**Combinatorial Commutative Algebra**, Organizers: Sara Faridi, Susan Morey, Hermann Brown 227

10:15-10:35 Jenna Rajchgot. [Regularity Of Schubert Determinantal Ideals And Related Ideals](#)

10:45-11:05 Kuei-Nuan Lin. [Blow-Up Algebras Of Three-Dimensional Ferrers Diagrams](#)

11:15-11:35 Louiza Fouli. [Initially Regular Sequences](#)

11:45-12:05 Susan Cooper. [Monomial Ideals & Symbolic Powers](#)

**WICA: Women in Commutative Algebra**, Organizers: Sandra Spiroff, Adela Vraciu, Herzstein 212

- 10:15-10:35 Janet Vassilev. [\*Tight Interiors And Related Ideals In Stanley-Reisner Rings\*](#)  
10:45-11:05 Haydee Lindo. [\*Trace modules, rigidity and ring classifications\*](#)  
11:15-11:35 Alexandra Seceleanu. [\*Lefschetz Properties For Connected Sums And Fibered Products\*](#)  
11:45-12:05 Rebecca R.G. [\*Characteristic-Free Test Ideals\*](#)

**Education Partnerships: University Mathematics Faculty and K-12 Mathematics Teachers**, Organizer: Evan Rushton, Herzstein 210

- 10:15-10:35 Anne Papakonstantinou. [\*The Rice University School Mathematics Project: Its Evolution And Current Efforts\*](#)  
10:45-11:05 Adem Ekmekci. [\*Being Research-Based And Research-Minded In Helping K-12 Mathematics Education\*](#)  
11:15-11:35 Cymra Haskell. [\*Mathematicians In K-12 Mathematics Education\*](#)  
11:45-12:05 Evan Rushton. [\*USC Math Initiative's Teacher Trainer Of Trainers Pilot Study\*](#)

**New Advances in Symplectic and Contact Topology**, Organizers: Jo Nelson, Morgan Weiler, Hermann Brown 423

- 10:15-10:35 Ziva Myer. [\*Product Structures For Legendrian Submanifolds With Generating Families\*](#)  
10:45-11:05 Yu Pan. [\*All The Augmentations Come From Immersed Lagrangian Fillings\*](#)  
11:15-11:35 Bahar Acu. [\*Planarity In Higher-Dimensional Contact Manifolds\*](#)  
11:45-12:05 Emmy Murphy. [\*Weinstein Kirby Calculus\*](#)

**Topology of 3- and 4-Manifolds**, Organizers: Allison N. Miller, Arunima Ray, Hermann Brown 427

- 10:15-10:35 Rachel Roberts. [\*CTFs In 3-Manifolds\*](#)  
10:45-11:05 Maggie Miller. [\*Fiberings 4-Manifolds Via Movies Of Singular Fibrations\*](#)  
11:15-11:35 Christine Ruey Shan Lee. [\*Quantum Invariants And Ribbon Links\*](#)  
11:45-12:05 Patricia Cahn. [\*Invariants Of Fox-Colorable Knots From Branched Covers Of 4-Manifolds\*](#)

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**Saturday, April 6, 2019. Afternoon Sessions (3:15 - 5:15)**

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**WIN: Women in Numbers** Organizers: Michelle Manes and Ila Varma, Hermann Brown 453



- 3:15-3:35 Yuan Liu. [\*On The Level Of Modular Curves That Give Rise To Sporadic J-Invariants\*](#)  
 3:45-4:05 Catalina Camacho Navarro. [\*Modular Curves Of Low Composite Level And Genus Zero Subgroups\*](#)  
 4:15-4:35 McKenzie Rachel West. [\*Brauer-Manin Computations For A Family Of K3 Surfaces\*](#)  
 4:45-5:05 Jennifer Berg. [\*Odd Ordered Transcendental Obstructions To The Hasse Principle On K3 Surfaces\*](#)

**WinCompTop: Women in Computational Topology** Organizers: Erin Chambers, Brittany Terese Fasy, Elizabeth Munch, Keck 100

- 3:15-3:35 Radmila Sazdanovic. [\*Machine Learning Revelations From the Color Jones Polynomial\*](#)  
 3:45-4:05 Moira Chas. [\*Computer Driven Questions And Theorems And In Geometry\*](#)  
 4:15-4:35 Mao Li. [\*Applications Of Topological Data Analysis In Plant Science\*](#)  
 4:45-5:05 Sarah Tymochko. [\*Using Persistent Homology To Quantify A Diurnal Cycle In Hurricane Felix\*](#)

**WIMB: Women in Math Biology** Organizers: Angela Peace, Wenjing Zhang, Keck 105

- 3:15-3:35 Christina Edholm. [\*Searching For Superspreaders: Identifying Epidemic Patterns Associated With Superspreading Events In Stochastic Models\*](#)  
 3:45-4:05 Marissa Renardy. [\*Modeling Tumor Immune Dynamics In Multiple Myeloma\*](#)  
 4:15-4:35 Rebecca Everett. [\*Fronts Of Locusts: Modeling Foraging Behavior In The Australian Plague Locust\*](#)  
 4:45-5:05 Miranda Teboh-Ewungkem. [\*Intermittent Preventive Treatment \(IPT\) And Antimalarial Drug Resistance Spread\*](#)

**WINASC: Women in Numerical Analysis and Scientific Computing** Organizers: Bo Dong, Adrianna Gillman, Duncan Hall 1064

- 3:15-3:35 Jingwei Hu. [\*A Second-Order Asymptotic-Preserving And Porosity-Preserving Exponential Runge-Kutta Method For A Class Of Stiff Kinetic Equations\*](#)  
 3:45-4:05 Chiu-Yen Kao. [\*Maximal Convex Combinations Of Sequential Steklov Eigenvalues\*](#)  
 4:15-4:35 Wei Wang. [\*A High Order Well-Balanced Particle-In-Cell Method For Shallow Water Equations\*](#)  
 4:45-5:05 Yingda Cheng. [\*Numerical Methods For Nonlinear Maxwell's Equations In Optics\*](#)

**WiSh: Women in Shape Modeling**, Organizers: Kathryn Leonard, Terry Knight, Keck 101

- 3:15-3:35 Mine Ozkar. [\*The Matter Of Shape: Purpose And Techniques That Bring About The Visible\*](#)  
 3:45-4:05 Cindy Grimm. [\*Metrics For Modeling Robotic Grasping\*](#)  
 4:15-4:35 Emily Whiting. [\*Mechanics-Based Design For Computational Fabrication\*](#)

4:45-5:05 Caitlin Mueller. [\*Shaping For Structural Performance In Architecture: Computational Design And Optimization\*](#)

**WIC: Women in Control** Organizers: Lorena Bociu, Irena Lasiecka, Duncan Hall 1042

3:15-3:35 Bozenna Pasik-Duncan. [\*Advances in noise modeling in stochastic systems and control\*](#)

3:45-4:05 Giusy Mazzone. [\*On The Motion Of Rigid Bodies With A Fluid-Filled Gap\*](#)

4:15-4:35 Marta Lewicka. [\*Random Tug Of War Games For The  \$p\$ -Laplacian:  \$1 < p < \infty\$\*](#)

4:45-5:05 Ivonne Rivas. [\*Exact Controllability Of A Linear Korteweg-de Vries Equation By The Flatness Approach\*](#)

**WIMM: Women in Math Materials**, Organizers: Malena Espanol, Hala Ah Shehadeh, Herzstein 211

3:15-3:35 Yue Yu. [\*A Neumann-Type Boundary Condition For Nonlocal Problems\*](#)

3:45-4:05 Amanda Howard. [\*A Mathematical Model For Fluid Flow In A Fractured Media\*](#)

4:15-4:35 Xiaochuan Tian. [\*Numerical Mathematics For Peridynamics And Nonlocal Models\*](#)

4:45-5:05 Malena Espanol. [\*Discrete-To-Continuum Modeling Of Weakly Interacting Incommensurate Lattices\*](#)

**WIG: Women in Geometry** Organizers: Liz Stanhope, Chikako Mese, and Sema Salur, Mech Lab 254

3:15-3:35 Pamela Sargent. [\*Index Bounds For Free Boundary Minimal Surfaces Of Convex Bodies\*](#)

3:45-4:05 Xuan Nguyen. [\*Finding Shrinking Doughnuts, An Alternate Proof\*](#)

4:15-4:35 Priyanka Rajan. [\*Exotic Spheres Of Cohomogeneity Two\*](#)

4:45-5:05 Allie Ray. [\*Eigenvalue And Multiplicity Bounds For The Steklov Spectrum On Orbifolds\*](#)

**Applied and Computational Harmonic Analysis**, Organizers: Julia Dobrosotskaya, Xuemei Chen, Duncan Hall 1075

3:15-3:35 Anna Ma. [\*The Kaczmarz Algorithm For Multiple Measurement Vectors\*](#)

3:45-4:05 Wenjing Liao. [\*Learning Low-Dimensional Manifolds, Functions On Manifolds And PDEs From Data\*](#)

4:15-4:35 Longxiu Huang. [\*Dynamic Sampling\*](#)

4:45-5:05 Karamatou Yacoubou-Djima. [\*Diffusion Frames On Graphs\*](#)

**Braid Groups and Quantum Computing** Organizers: Colleen Delaney, Jennifer Vasquez, Helen Wong, Herzstein 210

3:15-3:35 Jennifer Vasquez. [\*Qubit Braid Group Representations\*](#)

3:45-4:05 Colleen Delaney. [\*Fusion Categories And Quantum Computing\*](#)

- 4:15-4:35 Iris Cong. [Universal Quantum Computation With Gapped Boundaries](#)  
4:45-5:05 Julia Plavnik. [Low-Dimensional Representations Of The Three Component Loop Braid Group](#)

**Combinatorial Commutative Algebra**, Organizers: Sara Faridi, Susan Morey, Hermann Brown  
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- 3:15-3:35 Selvi Beyarslan. [Algebraic Invariants of Weighted Oriented Paths and Cycles](#)  
3:45-4:05 Mayada Shahada. [Sub-Additivity Property Of Syzygies Of Monomial Ideals Via Lattice Complements](#)  
4:15-4:35 Sonja Mapes. [Computing Projective Dimension Of Monomial Ideals Via Associated Hypergraphs And lcm-Lattices](#)  
4:45-5:05 Aihua Li. [Zero Divisor Graphs of Matrices over Commutative Rings](#)

**WICA: Women in Commutative Algebra**, Organizers: Sandra Spiroff, Adela Vraciu, Herzstein  
212

- 3:15-3:35 Oana Veliche. [Linkage And Classification Of Grade Three Perfect Ideals](#)  
3:45-4:05 Liana Segal. [The Structure Of Quasi-Complete Intersection Ideals](#)  
4:15-4:35 Hema Srinivasan. [Structure Of Some Semigroup Rings And Their Resolutions](#)  
4:45-5:05 Susan Cooper. [The Generalized Minimum Distance Function](#)

**New Advances in Symplectic and Contact Topology**, Organizers: Jo Nelson, Morgan Weiler,  
Hermann Brown 423

- 3:15-3:35 Susan Tolman. [Beyond Semitoric](#)  
3:45-4:05 Saraswathi Venkatesh. [Symplectic Cohomology Of Subdomains](#)  
4:15-4:35 Catherine Cannizzo. [Homological Mirror Symmetry For The Genus 2 Curve In An Abelian Variety And Its Generalized Strominger-Yau-Zaslow Mirror](#)  
4:45-5:05 Roberta Guadagni. [New Advances In Symplectic And Contact Topology](#)

**New Developments in Algebraic Biology**, Organizers: Anne Shiu, Brandilyn Stigler, Mech Lab  
251

- 3:15-3:35 Elizabeth Gross. [Distinguishing And Inferring Phylogenetic Networks](#)  
3:45-4:05 Nora Youngs. [Neural Ring Homomorphisms And Maps Between Neural Codes](#)  
4:15-4:35 Nida Kazi Obatake. [The Capacity For Hopf Bifurcations In The Fully Distributive Dual-Site Phosphorylation Network](#)  
4:45-5:05 Xiaoxian Tang. [Multistationarity In Structured Reaction Networks](#)

**Topology of 3- and 4-Manifolds**, Organizers: Allison N. Miller, Arunima Ray, Hermann Brown  
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- 3:15-3:35 Emmy Murphy. [\*Dissolving Large Index Covering Spaces Of 4-Manifolds\*](#)  
3:45-4:05 Melissa Zhang. [\*Localization, Smith-Type Inequalities, And Khovanov Homology\*](#)  
4:15-4:35 Caitlin Levenson. [\*DGA Representations, Ruling Polynomials, And The Colored HOMFLY-PT Polynomial\*](#)  
4:45-5:05 Gordana Matic. [\*Spectral Order Contact Invariant From Heegaard Floer Homology\*](#)

**Women in Data Science**, Organizers: Jing Qin, Yifei Lou, Duncan Hall 1070

- 3:15-3:35 Sung Ha Kang. [\*Identifying Differential Equation Using Numerical Techniques\*](#)  
3:45-4:05 Yifei Lou. [\*Nonconvex Approaches In Data Science\*](#)  
4:15-4:35 Jing Qin. [\*Graph Regularizations In EEG Source Localization\*](#)  
4:45-5:05 Li Wang. [\*Probabilistic Dimensionality Reduction Via Structure Learning\*](#)

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## Sunday, April 7, 2019. Morning Sessions (9:30 - 11:30)

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**WIMB: Women in Math Biology** Organizers: Angela Peace, Wenjing Zhang, Keck 105

- 9:30-9:50 Katharine Gurski. [\*A Sexually Transmitted Disease Model With Longterm Partnerships In Homogeneous And Heterogeneous Populations\*](#)  
10:00-10:20 Zhilan Feng. [\*Implications For Infectious Disease Models Of Heterogeneous Mixing On Control Thresholds\*](#)  
10:30-10:50 Heather Brooks. [\*Parasites And The Evolution Of Sociality: How Social Complexity And Grooming Efficiency Affect The Selective Pressures On Group Organization\*](#)  
11:00-11:20 Wenjing Zhang. [\*Global Stability And Re-emergence In A Cholera Model Considering Stochastic Fluctuations In Pathogen-Host Encounter\*](#)

**ACxx: Women in Algebraic Combinatorics**, Organizers: Elizabeth Niese, Elizabeth Drellich, Keck 105

- 9:30-9:50 Maria Monks Gillespie. [\*A Characterization Of Queer Supercrystals\*](#)  
10:00-10:20 Kassie Archer. [\*Pattern avoidance, cycle type, and characters of the symmetric group\*](#)  
10:30-10:50 Martha Yip. [\*A Minmaj-Preserving Crystal On Ordered Multiset Partitions\*](#)  
11:00-11:20 Margaret Readdy. [\*Geometric Proofs Of Some Combinatorial Identities Of Morel\*](#)

**WINART: Women in Noncommutative Algebra and Representation Theory**, Organizers: Van C. Nguyen, Julia Plavnik, Sarah Witherspoon, Herman Brown 453

- 9:30-9:50 Ellen Kirkman. [\*Bounds On The Degrees Of Minimal Generators Of Invariants\*](#)

10:00-10:20 Qing Zhang. [Classification Of Super-Modular Categories By Rank](#)  
10:30-10:50 Jieru Zhu. [Two Boundary Centralizer Algebras For  \$q\(n\)\$](#)   
11:00-11:20 Frauke Bleher. [Top Exterior Quotients Of Iwasawa Modules](#)

**WIT: Women in Topology** Organizers: Sarah Yeakel, Martina Rovelli, Mech Lab 254

- 9:30-9:50 Kathryn Lesh. [Connectivity Of Complexes Related To Homological Stability](#)  
10:00-10:20 Angelica Osorno. [2-Segal Spaces And The Waldhausen Construction](#)  
10:30-10:50 Kate Ponto. [Refining Fixed Point Invariants](#)  
11:00-11:20 Carmen Rovi.

**WISDM: Women in the Science of Data and Mathematics** Organizers: Linda Ness, Carlotta Domeniconi, Keck 101

- 9:30-9:50 Giseon Heo. [Analysis Of Facial Morphology Of Pediatric Obstructive Sleep Apnea Patients](#)  
10:00-10:20 Patricia Medina. [Deep Learning In Crowd Flow Exit Data](#)  
10:30-10:50 Jessica Metcalf-Burton. [Hubness: What Is It, And What's It Good For?](#)  
11:00-11:20 Anna Little. [Path-Based Spectral Clustering: Guarantees, Robustness To Outliers And Fast Algorithms](#)

**WIG: Women in Geometry** Organizers: Liz Stanhope, Chikako Mese, Sema Salur, Hermann Brown 427

- 9:30-9:50 Colleen Robles.  
10:00-10:20 Sema Salur. [Calibrations On Manifolds With Special Holonomy](#)  
10:30-10:50 Chikako Mese. [Harmonic maps into CAT\(1\) spaces](#)

**Analysis and Numerical Methods for Kinetic Transport and Related Models**, Organizer: Liu Liu, Keck 100

- 9:30-9:50 Li Wang. [Primal Dual Methods For Wasserstein Gradient Flows](#)  
10:00-10:20 Sona Akopian. [On Global Weak  \$L\_p\$  Solutions To A Class Of Boltzmann Equations With An Angle-Potential Concentrated Collision Kernel](#)  
10:30-10:50 Jingwei Hu. [A Discontinuous Galerkin Fast Spectral Method For The Multi-Species Boltzmann Equation](#)  
11:00-11:20 Yingda Cheng. [An Adaptive High-Order Piecewise Polynomial Based Sparse Grid Collocation Method With Applications](#)

**Origami, Belyi Maps, Dessins D'Enfants**, Organizers: Rachel Davis, Edray Goins, Herzstein 211

- 9:30-9:50 Edray Goins. [Monodromy Groups of Compositions of Belyi Maps](#)  
10:00-10:20 Rachel Davis. [Square-Tiled Surfaces In Topology And Arithmetic](#)  
10:30-10:50 Ozlem Ejder. [Arboreal Galois Representations Of Dynamical Belyi Maps](#)  
11:00-11:20 Bella Tobin. [Dessins D'Enfants For Single-Cycle Belyi Maps](#)

**Combinatorial Algebra** Organizers: Christine Berkesch, Laura Felicia Matusevich, Hermann Brown 423

- 9:30-9:50 Laura Escobar. [Wall-Crossing Phenomena For Newton-Okounkov Bodies](#)  
 10:00-10:20 Josephine Yu. [Positivity Hyperbolic Varieties And Tropical Geometry](#)  
 10:30-10:50 Jessica Sidman. [Rigidity Theory And Algebraic Matroids](#)  
 11:00-11:20 Patricia Jacobs Klein. [Edge ideals and liaison theory](#)

**Current Challenges in Mathematical Biology**, Organizer: Renee Dale, Herzstein 212

- 9:30-9:50 Renee Dale. [Identifying Critical Nodes From A Predicted Biological Network Using A Mathematical Model](#)  
 10:00-10:20 Raffael Bennett. [Modelling The Conformational Behavior Of Protein Drug Templates In Industrial Chromatography](#)  
 10:30-10:50 Jessica L. Burnett. *Advances in Ecological Regime Shift Detection Methods*  
 11:00-11:20 Shu-Xia Tang. [Routing \(Operators\) In Traffic Flow Modelling With Semilinear PDE](#)

**Graph Theory**, Organizers: Carolyn Reinhart, Kate Lorenzo, Duncan Hall 1046

- 9:30-9:50 Daphne Liu. [Colouring Of Generalized Signed Triangle-Free Planar Graphs](#)  
 10:00-10:20 Daniela Ferrero. [Generalizations Of Zero Forcing In Iterated Line Digraphs](#)  
 10:30-10:50 Mary Flagg. [Rigid Linkage Forcing](#)  
 11:00-11:20 Shanise Walker. [The Size Of N-Free Families](#)

**Math on the EDGE**, Organizers: Sarah Chehade, Hermann Brown 227

- 9:30-9:50 Keisha Cook. [A Parallel Implementation of the Delay SSA](#)  
 10:00-10:20 Paula Egging. [Rational Decay Of A Canonical Structural Acoustic PDE Dynamics](#)  
 10:30-10:50 Victoria Day. [Congruences Between Newforms And Modular Deformation Problems](#)  
 11:00-11:20 Nida Kazi Obatake. [Toric Ideals Of Neural Codes](#)

**Multiphysics and Multiscale Problems**, Organizers: Yue Yu, Xingjie Li, Duncan Hall 1042

- 9:30-9:50 Xiaoxiao Zhang. [Non-uniform Curvature And Anisotropy Confinement Control Wrinkling Patterns On Torus](#)  
 10:00-10:20 Emily Johnson. [Penalty Coupling Of Non-matching Isogeometric Kirchhoff-Love Shell Patches With Application To Complex Structures](#)  
 10:30-10:50 Weiqi Chu. [Nonlinear Constitutive Models For Nano-scale Heat Conduction](#)  
 11:00-11:20 Xiaochuan Tian. [Stability Of Nonlocal Dirichlet Integrals Using Nonlocal Gradient Operators](#)

**New Developments in Algebraic Biology**, Organizers: Anne Shiu, Brandilyn Stigler, Mech Lab 251

- 9:30-9:50 Elena Dimitrova. [Network Control Through Multistate Canalization](#)

- 10:00-10:20 Anyu Zhang. [Partitioning Data Using Monomial Bases To Improve Network](#)  
10:30-10:50 Kaitlyn Phillipson. [Grobnor Bases Of Neural Ideals](#)  
11:00-11:20 Ngoc M Tran. [Automated Spike Sorting For Large-Scale, Long-Term Recordings](#)

**On Advances and New Techniques of Fluid Dynamics and Dispersive Equations**, Organizer:  
Betul Orcan Ekmekci, Duncan Hall 1064

- 9:30-9:50 Chengcheng Yang. [Regularity Behavior Of Geodesics On A Complex Variety](#)  
10:00-10:20 Maria Radosz. [Blowup For Model Equations Of Fluid Mechanics](#)  
10:30-10:50 Betul Orcan-Ekmekci. [Geometric Properties Of Euler Equation On The Torus](#)  
11:00-11:20 Kayla Bicol. [A Deconvolution-Based Large Eddy Simulation Method For Incompressible Flows And Advection-Diffusion-Reaction Problems](#)

**Recent Developments in the Analysis of Obstacle Problems**, Organizers: Donatella Danielli,  
Camelia Pop, Duncan Hall 1075

- 9:30-9:50 Ryan Hynd. [Extremals Functions For Morrey's Inequality](#)  
10:00-10:20 Ru-Yu Lai. [Global Uniqueness For The Fractional Semilinear Schrodinger Equation](#)  
10:30-10:50 Stefania Patrizi. [A Segregation Model With Local Vs Nonlocal Diffusion](#)  
11:00-11:20 Luca Spolaor. [\(Log\)-Epiperimetric Inequality For The Thin Obstacle Problem](#)

**Women in Data Science**, Organizers: Jing Qin, Yifei Lou, Herzstein 210

- 9:30-9:50 Xuemei Chen. [Sensing with Redundant Frames](#)  
10:00-10:20 Ngoc Tran. [Neuron Spike Sorting](#)  
10:30-10:50 Miju Ahn. [Difference-Of-Convex Programming For Sparse Learning](#)  
11:00-11:20 Andrea Arnold. [Time-Varying Parameter Estimation Via Nonlinear Filtering](#)

**Wikipedia Edit-a-Thon**, Organizers: Denise Rangel Tracy, Beccah Mackinnon, McMurtry  
Auditorium, Duncan Hall

9:30-11:20 Denise Rangel Tracy and Beccah Mackinnon. [Wikipedia Edit-a-Thon](#)  
*Volunteer working actively to counteract Wikipedia's gender gap by contributing to biographies of women mathematicians and pages about their accomplishments. The session is led by WikiFellows who have experience writing and editing Wikipedia articles. They will help you get started on the process, as well as bring ideas on what to edit. Everyone is welcome, especially new editors; come join us!*

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## Poster Presenters

*Posters will be exhibited during the entire symposium in and around the first floor of Duncan Hall. Presenters will be at their posters to discuss their work on **Saturday from 2:30 - 3:15pm.***

Anna Aboud, [An Efficient Algorithm for Perturbed Data Sets](#)



Lale Asik, [\*Dynamics of a Producer-Grazer Model Incorporating the Effects of Phosphorus Loading on Grazer's Growth\*](#)

Rhea Palek Bakshi, [\*On the KBSA of the Thickened T-Shirt\*](#)

Catherine Berrouet, [\*A Mathematical Model of Anti-Cancer Drug's IC50 Values in Monolayer and Spheroid Cultures\*](#)

Ariel Bowman, [\*Mathematical Modeling of a Network of neurons regarding G1D Transport Deficiency Epilepsy Seizures\*](#)

Danielle Brager, [\*Mathematically Investigating Cone Photoreceptor Death in Retinitis Pigmentosa\*](#)

Juliette Bruce, [\*Asymptotic Syzygies for Products of Projective Space\*](#)

Sutthirut Charoenphon, [\*Vanishing Relaxation Time Dynamics of the Moore-Gibson-Thompson \(MGT\) Equation Arising in High Frequency Ultrasound\*](#)

Weiqi Chu, [\*Nonlinear Constitutive Models for Nano-scale Heat Conduction\*](#)

Ngoc Do, [\*Theoretically exact solution of the inverse source problem for the wave equation with spatially and temporally reduced data\*](#)

Francesca Gandini, [\*Ideals associated to subspace arrangements\*](#)

Xiaoqian Gong, [\*Weak Measure-valued Solution to a Nonlinear Hyperbolic Conservation Law Modeling a Highly Re-entrant Manufacturing System\*](#)

Emily Johnson, [\*Penalty Coupling of Non-Matching Isogeometric Kirchhoff–Love Shell Patches with Application to Complex Structures\*](#)

Tiffany Jones, [\*On the stability and accuracy of a dual-scale approximation to self-focusing Helmholtz problems\*](#)

Lara Kassab, [\*On Infinite Multidimensional Scaling\*](#)

Daewa Kim, [\*A Kinetic Theory Approach to Pedestrian Motion\*](#)

Mehtap Iafci, [\*Mathematical Modeling of Post-Myocardial Infarction Left Ventricular Remodeling\*](#)

Jennifer Li, [\*The Kawamata-Morrison-Totaro Cone Conjecture for Log Calabi-Yau Surfaces\*](#)

Kate Lorenzen, [\*Constructions of Distance Laplacian Cospectral Graphs\*](#)

Danielle Middlebrooks, [\*Quantifying Flows in Time-Irreversible Markov Chains: Application to a Gene Regulatory Network\*](#)

Duong Nguyen, [\*Texas Women in Mathematics Symposium 2018\*](#)

Elpiniki Nikolopoulou, [\*Tumor-immune dynamics with an immune checkpoint inhibitor\*](#)

Omomayowa Olawoyin, [\*Effects of Multiple Transmission Pathways on Zika Dynamics\*](#)

Carolyn Reinhart, [\*The normalized distance Laplacian Matrix\*](#)

Aleksandra Sobieska Snyder, [\*Minimal Free Resolutions over Rational Normal Scrolls\*](#)

Sarah Yoseph, [\*An Enumeration Process of n-Quandles\*](#)

Jiahui Yu, [\*Smoothing Spline Semiparametric Density Models\*](#)

Fatma Zürnacı, [Generalized Taylor Series](#)

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## **AWM Research Symposium Organizing Committee**

Steven Ferrucci, AWM Managing Director  
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Shelly Harvey, Rice University  
Raegan Higgins, Texas Tech University  
Magnhild Lien, CSU Northridge  
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Karoline Pershell, AWM Executive Director  
Ami Radunskaya, Pomona College  
Beatrice Rivière, Rice University