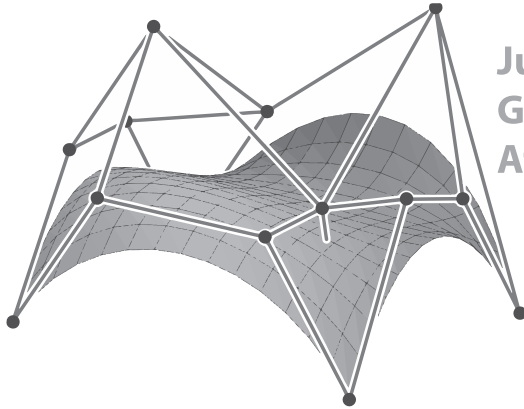## SIAM Conference on
Applied Algebraic Geometry

July 31 – August 4, 2017
Georgia Institute of Technology
Atlanta, Georgia, USA

Sponsored by the SIAM Activity Group on
Algebraic Geometry

The purpose of the SIAM Activity Group on Algebraic Geometry is to bring together researchers who use algebraic geometry in industrial and applied mathematics. "Algebraic geometry" is interpreted broadly to include at least: algebraic geometry, commutative algebra, noncommutative algebra, symbolic and numeric computation, algebraic and geometric combinatorics, representation theory, and algebraic topology. These methods have already seen applications in: biology, coding theory, cryptography, combustion, computational geometry, computer graphics, quantum computing, control theory, geometric design, complexity theory, machine learning, nonlinear partial differential equations, optimization, robotics, and statistics.

We welcome participation from both theoretical mathematical areas and application areas not on this list which fall under this broadly interpreted notion of algebraic geometry and its applications.

siam.

Table of Contents

Organizing Committee Co-Chairs

David A. Cox
Amherst College, USA

Serkan Hosten
San Francisco State University, USA

Local Organizers

Greg Blekherman
Georgia Institute of Technology, USA

Anton Leykin
Georgia Institute of Technology, USA

Josephine Yu
Georgia Institute of Technology, USA

Organizing Committee

Alicia Dickenstein
Universidad de Buenos Aires, Argentina

Hoon Hong
North Carolina State University, USA

Teresa Krick
Universidad de Buenos Aires, Argentina

Kristin Lauter
Microsoft Research, USA

Lek-Heng Lim
University of Chicago, USA

Dmitriy Morozov
Lawrence Berkeley National Laboratory, USA

Frank Sottile
Texas A&M University, USA

Thorsten Theobald
Goethe-Universitaet, Frankfurt, Germany

Ruriko Yoshida
Naval Postgraduate School, USA

SIAM Registration Desk

The SIAM registration desk is located in the Skiles Building - Bottom (0-th) Floor. It is open during the following hours:

Monday, July 31
7:00 AM – 4:00 PM

Tuesday, August 1
7:30 AM – 4:00 PM

Wednesday, August 2
7:30 AM – 4:00 PM

Thursday, August 3
7:30 AM – 4:00 PM

Friday, August 4
7:30 AM - 4:00 PM

Child Care

For local child care resources, please use:

Friend of Family: +1-770-725-2748

TLC: +1-770-410-4774

Corporate Members and Affiliates

SIAM corporate members provide their employees with knowledge about, access to, and contacts in the applied mathematics and computational sciences community through their membership benefits. Corporate membership is more than just a bundle of tangible products and services; it is an expression of support for SIAM and its programs. SIAM is pleased to acknowledge its corporate members and sponsors. In recognition of their support, non-member attendees who are employed by the following organizations are entitled to the SIAM member registration rate.

Corporate/Institutional Members

The Aerospace Corporation

Air Force Office of Scientific Research

Amazon

Aramco Services Company

Bechtel Marine Propulsion Laboratory

The Boeing Company

CEA/DAM

Department of National Defence (DND/CSEC)

DSTO- Defence Science and Technology Organisation

Hewlett-Packard

Huawei FRC French R&D Center

IBM Corporation

IDA Center for Communications Research, La Jolla

IDA Center for Communications Research, Princeton

Institute for Defense Analyses, Center for Computing Sciences

Lawrence Berkeley National Laboratory

Lawrence Livermore National Labs

Lockheed Martin

Los Alamos National Laboratory

Max-Planck-Institute for Dynamics of Complex Technical Systems

Mentor Graphics

National Institute of Standards and Technology (NIST)

National Security Agency (DIRNSA)

Naval PostGrad

Oak Ridge National Laboratory, managed by UT-Battelle for the Department of Energy

Sandia National Laboratories

Schlumberger-Doll Research

United States Department of Energy

U.S. Army Corps of Engineers, Engineer Research and Development Center

US Naval Research Labs

List current June 2017.

Funding Agency

SIAM and the conference organizing committee wish to extend their thanks and appreciation to the U.S. National Science Foundation for its support of this conference.

Join SIAM and save!

Leading the applied mathematics community . . .

SIAM members save up to $65 on full registration for the 2017 SIAM Conference on Applied Algebraic Geometry! Join your peers in supporting the premier professional society for applied mathematicians and computational scientists. SIAM members receive subscriptions to *SIAM Review, SIAM News* and *SIAM Unwrapped,* and enjoy substantial discounts on SIAM books, journal subscriptions, and conference registrations.

If you are not a SIAM member and paid the Non-Member or Non-Member Mini Speaker/Organizer rate to attend the conference, you can apply the difference between what you paid and what a member would have paid ($65 for a Non-Member and $35 for a Non-Member Mini Speaker/Organizer) towards a SIAM membership. Contact SIAM Customer Service for details.

If you are a SIAM member, it only costs $15 to join the SIAM Activity Group on Algebraic Geometry (SIAG/AG). As a SIAG/AG member, you are eligible for an additional $15 discount on this conference, so if you paid the SIAM member rate to attend the conference, you might be eligible for a free SIAG/

AG membership. Contact SIAM Customer Service for details.

Free Student Memberships are available to students who attend an institution that is an Academic Member of SIAM, are members of Student Chapters of SIAM, or are nominated by a Regular Member of SIAM.

Go to *www.siam.org/joinsiam* to join online or download an application form, or contact SIAM Customer Service:

Telephone: +1-215-382-9800 (worldwide); or 800-447-7426 (U.S. and Canada only)

Fax: +1-215-386-7999
E-mail: *membership@siam.org*
Postal mail: Society for Industrial and Applied Mathematics, 3600 Market Street, 6th floor, Philadelphia, PA
19104-2688 USA

Standard Audio/Visual Set-Up in Meeting Rooms

SIAM does not provide computers for any speaker. When giving an electronic presentation, speakers must provide their own computers. SIAM is not responsible for the safety and security of speakers' computers.

The Plenary Session Room will have two (2) screens, one (1) data projector and one (1) overhead projector. All other concurrent/breakout rooms will have one (1) screen and one (1) data projector. The data projectors support both VGA and HDMI connections. Presenters requiring an alternate connection must provide their own adaptor.

Internet Access

Georgia Tech provides Eduroam on its campus. If your institution participates in Eduroam, please connect to this network. If not, you will be provided a temporary code to use wifi. Please inquire at the registration desk for additional information.

Registration Fee Includes

- Admission to all technical sessions
- Business Meeting (open to SIAG/AG members)
- Coffee breaks daily
- Room set-ups and audio/visual equipment
- Welcome Reception and Poster Session

Job Postings

Please visit *http://jobs.siam.org* to view the job postings available.

Important Notice to Poster Presenters

The poster session is scheduled for Monday, July 31 from 5:00 PM – 7:00 PM. Poster presenters are expected to set up their poster material on the provided 4' x 8' poster boards in the Klaus Advanced Computing Building by Monday, July 31 by 5:00 PM, the official start time of the session. Posters must be removed by 7:00 PM, the end of the poster session.

SIAM Books and Journals

SIAM books are available at a discounted price during the conference. Titles on Display forms are available with instructions on how to place a book order.

Conference Sponsor Advocate:

Name Badges

A space for emergency contact information is provided on the back of your name badge. Help us help you in the event of an emergency!

Comments?

Comments about SIAM meetings are encouraged! Please send to: Cynthia Phillips, SIAM Vice President for Programs (*vpp@siam.org*).

Get-togethers

Welcome Reception and Poster Session

Monday, July 31

5:00 PM – 7:00 PM

Business Meeting
(open to SIAG/AG members)

Thursday, August 3

5:15 PM – 6:15 PM

Statement on Inclusiveness

As a professional society, SIAM is committed to providing an inclusive climate that encourages the open expression and exchange of ideas, that is free from all forms of discrimination, harassment, and retaliation, and that is welcoming and comfortable to all members and to those who participate in its activities. In pursuit of that commitment, SIAM is dedicated to the philosophy of equality of opportunity and treatment for all participants regardless of gender, gender identity or expression, sexual orientation, race, color, national or ethnic origin, religion or religious belief, age, marital status, disabilities, veteran status, field of expertise, or any other reason not related to scientific merit. This philosophy extends from SIAM conferences, to its publications, and to its governing structures and bodies. We expect all members of SIAM and participants in SIAM activities to work towards this commitment.

Please Note

SIAM is not responsible for the safety and security of attendees' computers. Do not leave your personal electronic devices unattended. Please remember to turn off your cell phones and other devices during sessions.

Recording of Presentations

Audio and video recording of presentations at SIAM meetings is prohibited without the written permission of the presenter and SIAM.

Social Media

SIAM is promoting the use of social media, such as Facebook and Twitter, in order to enhance scientific discussion at its meetings and enable attendees to connect with each other prior to, during and after conferences. If you are tweeting about a conference, please use the designated hashtag to enable other attendees to keep up with the Twitter conversation and to allow better archiving of our conference discussions. The hashtag for this meeting is #SIAMAG17.

SIAM's Twitter handle is *@TheSIAMNews*.

Invited Plenary Speakers

** All Invited Plenary Presentations will take place in Clough Undergraduate Learning Commons – 152**

Monday, July 31

8:30 AM – 9:30 AM

IP1 Uses of Algebraic Geometry and Representation Theory in Complexity Theory

Joseph M. Landsberg, *Texas A&M University, USA*

1:30 PM – 2:30 PM

IP2 On the Stability of Solutions in Numerical Algebraic Geometry

Carlos Beltrán, *Universidad de Cantabria, Spain*

———————————————

Tuesday, August 1

8:30 AM – 9:30 AM

IP3 Algebraic Geometry for Geometric Modeling

Ragni Piene, *University of Oslo, Norway*

1:30 PM – 2:30 PM

IP4 Polynomial Dynamical Systems,
Toric Differential Inclusions, and the Global Attractor Conject

Gheorghe Craciun, *University of Wisconsin, Madison, USA*

SIAM Activity Group on
Applied Algebraic Geometry (SIAG/AG)

www.siam.org/activity/ag

A GREAT WAY TO GET INVOLVED!

Collaborate and interact with mathematicians and applied scientists whose work involves applied algebraic geometry.

ACTIVITIES INCLUDE:
- Special Sessions at SIAM meetings
- Biennial conference
- SIAG/Algebraic Geometry Early Career Prize
- SIAG/AG Wiki

BENEFITS OF SIAG/AG MEMBERSHIP:
- Listing in the SIAG's online membership directory
- Additional $15 discount on registration at the SIAM Conference on Applied Algebraic Geometry
- Electronic communications about recent developments in your specialty
- Electronic newsletter
- Eligibility for candidacy for SIAG/AG office
- Participation in the selection of SIAG/AG officers

SIAM Conference on
Applied Algebraic Geometry

July 31 – August 4, 2017
Georgia Institute of Technology
Atlanta, Georgia, USA

ELIGIBILITY:
- Be a current SIAM member.

COST:
- $15 per year
- Student members can join 2 activity groups for free!

2016-17 SIAG/AG OFFICERS

Chair:	Agnes Szanto, NC State University
Vice Chair:	Jan Draisma, Universitaet Bern
Program Director:	Serkan Hosten, San Francisco State University
Secretary:	Jonathan Hauenstein, University of Notre Dame

TO JOIN:

SIAG/AG: *my.siam.org/forms/join_siag.htm*
SIAM: *www.siam.org/joinsiam*

Invited Plenary Speakers

*** All Invited Plenary Presentations will take place in Clough Undergraduate Learning Commons – 152***

Wednesday, August 2

8:30 AM – 9:30 AM

IP5 Stochastic Geometry with Topological Flavor

Herbert Edelsbrunner, *IST Austria, Klosterneuburg, Austria*

1:30 PM – 2:30 PM

IP6 Curves with Complex Multiplication and Applications to Cryptography

Bianca Viray, *University of Washington, USA*

Thursday, August 3

8:30 AM – 9:30 AM

IP7 Gaussian Graphical Models from an Algebraic, Geometric and Combinatorial Perspective

Caroline Uhler, *Massachusetts Institute of Technology, USA*

1:30 PM – 2:30 PM

IP8 Open Problems in Finite Frame Theory

Dustin Mixon, *Air Force Institute of Technology, USA*

Invited Plenary Speakers

** All Invited Plenary Presentations will take place in Clough Undergraduate Learning Commons – 152**

Friday, August 4

8:30 AM – 9:30 AM

IP9 Caratheodory Style Theorems for Discrete Optimization and Game Theory

Jesús A. De Loera, *University of California, Davis, USA*

1:30 PM – 2:30 PM

IP10 Talk Title To Be Announced

Jean-Charles Faugère, *Inria Paris-Rocquencourt, France*

Prize Lecture

** The Prize Lecture will take place in Clough Undergraduate Learning Commons – 152**

Wednesday, August 2

5:15 PM – 6:00 PM

SP1 SIAG/AG Early Career Prize Lecture: A Brief History of Smale's 17th Problem

Pierre Lairez, *Inria Saclay Ile-de-France, France*

SIAM PRESENTS IS AN AUDIO-VISUAL ARCHIVE
COMPRISED OF MORE THAN 2,000 PRESENTATIONS
POSTED IN OVER 40 SEARCHABLE TOPICS, INCLUDING:

- algebraic geometry
- atmospheric and oceanographic science
- computational science
- data mining
- geophysical science
- optimization
- uncertainty quantification and more...

The collection, *Featured Lectures from our Archives*, includes audio and slides from more than 30 conferences since 2008, including talks by invited and prize speakers, select minisymposia, and minitutorials. Presentations from SIAM meetings are being added throughout the year.

In addition you can view short video clips of speaker interviews from sessions at Annual Meetings starting in 2010.

Plans for adding more content are on the horizon. Keep an eye out!

The audio, slide, and video presentations are part of SIAM's outreach activities to increase the public's awareness of mathematics and computational science in the real world, and to bring attention to exciting and valuable work being done in the field. Funding from SIAM, the National Science Foundation, and the Department of Energy was used to partially support this project.

New presentations are posted every few months as the program expands with sessions from additional SIAM meetings. Users can search for presentations by category, speaker name, and/or key words.
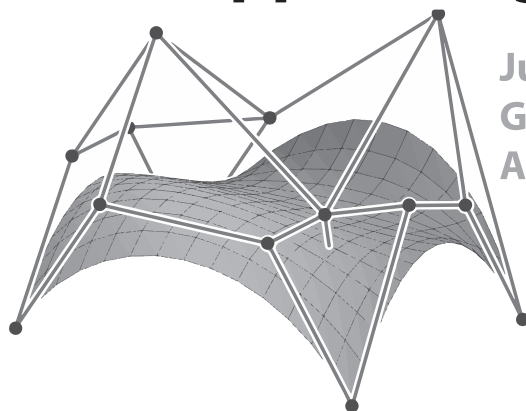
www.siam.org/meetings/presents.php

Notes

Program Schedule

SIAM Conference on
Applied Algebraic Geometry

July 31 – August 4, 2017
Georgia Institute of Technology
Atlanta, Georgia, USA

Monday, July 31

Registration
7:00 AM-4:00 PM

Room:Skiles Building - Bottom (0-th) Floor

Welcome Remarks
8:20 AM-8:30 AM

Room:Clough Undergraduate Learning Commons - 152

Monday, July 31

IP1

Uses of Algebraic Geometry and Representation Theory in Complexity Theory

8:30 AM-9:30 AM

Room:Clough Undergraduate Learning Commons - 152

Chair: Lek-Heng Lim, University of Chicago, USA

I will discuss two central problems in complexity theory and how they can be approached geometrically. In 1968, Strassen discovered that the usual algorithm for multiplying matrices is not the optimal one, which motivated a vast body of research to determine just how efficiently nxn matrices can be multiplied. The standard algorithm uses on the order of n^3 arithmetic operations, but thanks to this research, it is conjectured that asymptotically, it is nearly as easy to multiply matrices as it is to add them, that is that one can multiply matrices using close to n^2 multiplications. In 1978 L. Valiant proposed an algebraic version of the famous P v. NP problem. This was modified by Mulmuley and Sohoni to a problem in algebraic geometry: Geometric Complexity Theory (GCT), which rephrases Valiant's question in terms of inclusions of orbit closures. I will discuss matrix multiplication, GCT, and the geometry involved, including: secant varieties, dual varieties, minimal free resolutions, and the Hilbert scheme of points.

Joseph M. Landsberg
Texas A&M University, USA

Coffee Break
9:30 AM-10:00 AM

Room:Skiles Building

Monday, July 31

MS1

Applications of Computational Algebraic Geometry to Cryptology - Part I of III

10:00 AM-12:00 PM

Room:Skiles Building - 249

For Part 2 see MS11

The goal of this minisymposium is to bring together experts in cryptology and in computational algebraic geometry to discuss the interaction of recent developments in algebraic computations and related problems arising in cryptology. A particular focus is put on algorithms for counting points on curves defined over finite fields, on algorithms for solving polynomial systems over finite fields, and on computational methods for post-quantum cryptography.

Organizer: Alessio Caminata
University of Barcelona, Spain

Organizer: Maike Massierer
University of New South Wales, Australia

Organizer: Pierre-Jean Spaenlehauer
Inria, France

10:00-10:25 Practical Post-quantum Cryptography
Tanja Lange, Technische Universiteit Eindhoven, The Netherlands

10:30-10:55 Code-based Hybrid Encryption, Revisited
Edoardo Persichetti, Florida Atlantic University, USA

11:00-11:25 Computation of Isogenies and Frobenius
Cyril Hugounenq, Laboratoire de Mathématiques de Versailles, France

11:30-11:55 Efficient Compression of SIDH Public Keys
Craig Costello, Microsoft Research, USA; *David Jao*, University of Waterloo, Canada; Patrick Longa and Michael Naehrig, Microsoft Research, USA; Joost Renes, Radboud University Nijmegen, The Netherlands; David Urbanik, University of Waterloo, Canada

Monday, July 31

MS2

Algebraic and Geometric Methods in Discrete Optimization - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 268

For Part 2 see MS12

Ideas from algebra, number theory, and geometry and topology have influenced the way we think about algorithms for solving optimization problems with discrete constraints, i.e. integer, mixed integer and combinatorial problems. E.g., New methods such as Groebner bases gave an impulse for the design of new augmentation algorithms for integer programs. Similarly convex geometry arguments are used in the investigation of mixed integer programs. Today non-linear constraints present in models highlight the importance of using methods from algebra and geometry too. In this symposium we discuss several fascinating instances of such tools of analysis.

Organizer: Jesus De Loera
University of California, Davis, USA

10:00-10:25 Understanding Deep Neural Networks with Rectified Linear Units

Amitabh Basu, Raman Arora, Poorya Mianjy, and Anirbit Mukherjee, Johns Hopkins University, USA

10:30-10:55 Discrete Quantitative Helly Number

Gennadiy Averkov, Universität Magdeburg, Germany

11:00-11:25 Using Linear Symmetries in Integer Convex Optimization

Frieder Ladisch, University of Rostock, Germany

11:30-11:55 Sparse Solutions of Integer Programs

Iskander Aliev, Cardiff University, United Kingdom

Monday, July 31

MS3

Newton-Okounkov Bodies and Khovanskii Bases - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 255

For Part 2 see MS22

The theory of Newton-Okounkov bodies generalizes that of Newton Polytopes, giving a conceptual framework for root counts to systems of functions in terms of volumes and mixed volumes of convex Newton-Okounkov bodies. While the asymptotic definition of these bodies is not particularly constructive, when they admit a Khovanskii basis, they are polyhedral. Having a Khovanskii basis enables other methods based on polyhedra to be used. While Newton-Okounkov bodies arose to solve questions from pure mathematics they have significant potential in applications. These include providing a foundation for root counts for polynomial systems from applications, the use of these root counts and Khovanskii bases for solving, and a host of algorithmic questions involving computing/determining Newton-Okounkov bodies and Khovanskii bases. The purpose of this minisymposium is to explore some of these opportunities and to advertise this to the wider community of applied algebraic geometry.

Organizer: Frank Sottile
Texas A&M University, USA

10:00-10:25 Newton-Okounkov Bodies and Khovanskii Bases for Applications

Frank Sottile, Texas A&M University, USA

10:30-10:55 Flag Varieties of Type A, String Polytopes, and Superpotentials

Lara Bossinger, University of Cologne, Germany

11:00-11:25 Computing Toric Degenerations of Flag Varieties Arising from Tropical Geometry

Fatemeh Mohammadi, Technische Universität Berlin, Germany

11:30-11:55 Volumes of Newton-Okounkov Bodies of Hessenberg Varieties and their Cohomology Rings

Hiraki Abe, McMaster University, Canada

Monday, July 31

MS4

New Trends in Polynomial System Solving and Applications - Part I of III

10:00 AM-12:00 PM

Room:Skiles Building - 254

For Part 2 see MS14

Polynomial systems arise in numerous areas of mathematics and computer science, such as control theory, geometric modeling, biochemistry, coding theory and cryptology, to name a few. Efficient and reliable solvers for polynomial systems are in the epicentre of applied algebraic geometry and computer algebra. Available tools for recovering the solutions include Groebner bases, characteristic sets, multivariate resultants as well as symbolic-numeric methods and subdivision-based solvers. Among the challenges which occur in the process is reliable root isolation, certification and approximation, treatment of singular solutions, the exploitation of structure coming from specific applications as well as the development of reliable software. The minisymposium will host presentations related to state-of-the-art solution strategies for these problems, theoretical and algorithmic advances as well as emerging application areas.

Organizer: Angelos Mantzaflaris
RICAM, Austrian Academy of Sciences, Austria

Organizer: Elias Tsigaridas
INRIA Paris, France

10:00-10:25 Resultant Formulations for Structured Polynomials and System Solving

Angelos Mantzaflaris, RICAM, Austrian Academy of Sciences, Austria; Elias Tsigaridas, INRIA Paris, France

10:30-10:55 Dedekind Zeta Functions and Complex Dimension

J. Maurice Rojas and Yuyu Zhu, Texas A&M University, USA

11:00-11:25 Computing the Annihilator of Sequences

Hamid Rahkooy, University of Waterloo, Canada

11:30-11:55 Real Solving of Bivariate Real Equation Systems

Jinsan Cheng, Chinese Academy of Sciences, China

Monday, July 31

MS5

From Approximation Theory to Tensor Decomposition - Part I of II

10:00 AM-11:30 AM

Room:Skiles Building - 270

For Part 2 see MS15

This minisymposium studies the connections among sparse interpolation, exponential analysis, rational approximation, orthogonal polynomials, generalized eigenvalue computation and tensor decompositions. We are aiming at a discussion among experts from the domains that are involved. This connection may have an impact on a large number of applications in computational science and engineering.

Organizer: Wen-shin Lee
University of Antwerp, Belgium

Organizer: Annie Cuyt
University of Antwerp, Belgium

Organizer: Mariya Ishteva
Vrije Universiteit Brussel, Belgium

Organizer: Ivan Markovsky
Vrije Universiteit Brussel, Belgium

10:00-10:25 Tensor Decompositions and Related Problems

Mariya Ishteva, Vrije Universiteit Brussel, Belgium

10:30-10:55 Symmetric Tensor Approximation

Ramin Goudarzi Karim and Carmeliza Navasca, University of Alabama at Birmingham, USA

11:00-11:25 Decoupling Multivariate Vector Functions using Tensors

Philippe Dreesen, Mariya Ishteva, and Johan Schoukens, Vrije Universiteit Brussel, Belgium

Monday, July 31

MS6

Polyhedral and Combinatorial Biology - Part I of IV

10:00 AM-11:30 AM

Room:Skiles Building - 005

For Part 2 see MS16

We explore the role that combinatorial and polyhedral structures play in understanding biological phenomenon. The rapid grown in technology, means that the sophistication of the algorithms used to analyze discrete biological data lags behind the availability of data. Discrete mathematicians are encouraged to attend this session, to learn about applications of their tools to biology. Biologists are encourage to attend to ensure that mathematicians are focused on problems that remain relevant in the rapidly developing biological landscape. Mathematical objects such as convex polyhedral, cell complexes, trees and networks can be used to understand a wide range of biological phenomena. This session will feature exploration of RNA secondary structures, neural codes, genome rearrangements as well as bacterial, gene, and species evolution. These applications show demonstrate how topics traditionally confined to the pure mathematical cannon help explore living organisms. In addition, this session will examine how biology generates novel mathematical questions and objects, such as the structure of varieties associated to Markov models of evolution, or the enumeration of gene trees under the coalescent model.

Organizer: Joseph P. Rusinko
Hobart and William Smith Colleges, USA

10:00-10:25 Quartet Trees in Phylogenomics

Joseph P. Rusinko, Hobart and William Smith Colleges, USA

10:30-10:55 The Binary Jukes-Cantor Model with a Molecular Clock

Jane Coons, North Carolina State University, USA

11:00-11:25 Recursive Linear Programming on the Balanced Minimal Evolution Polytope

Stefan Forcey, William Sands, and Logan Keefe, University of Akron, USA

Monday, July 31

MS7

Identifiability of Biological and Statistical Models - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 006

For Part 2 see MS17

A model is identifiable if its underlying parameters can be recovered from accurate observations. Identifiability is a crucial property for a model for it to be deployed in data analysis, as this insures that parameter recovery procedures based on the model and the particular observations are valid. When the model is not identifiability, changes to the model parametrization or the observations need to be made. Identifiability analysis of many models can be made using tools from differential algebra, algebraic geometry, combinatorics, and differential geometry. This minisymposium will highlight these applications.

Organizer: Seth Sullivant
North Carolina State University, USA

Organizer: Nicolette Meshkat
Santa Clara University, USA

10:00-10:25 Structural Identifiability of Biological Models

Nicolette Meshkat, Santa Clara University, USA

10:30-10:55 Geometric Classification of Structural and Practical Non-identifiability

Mark K. Transtrum, Brigham Young University, USA

11:00-11:25 Identifiability of a Generalized Hodgkin–Huxley Model

Olivia Walch, University of Michigan, USA

11:30-11:55 Structural and Practical Identifiability in Multistage Clonal Expansion Models of Cancer

Marisa Eisenberg, University of Michigan, USA

Monday, July 31
MS8
Algebraic Vision - Part I of II
10:00 AM-12:00 PM

Room:Skiles Building - 202

For Part 2 see MS18
Algebraic vision aims to explore the foundations of problems in computer vision using algebraic methods. The lectures in this session showcase recent results in this area.

Organizer: Rekha Thomas
University of Washington, USA

Organizer: Max Lieblich
University of Washington, USA

Organizer: Matthew Trager
Inria and École Normale Supérieure, France

10:00-10:25 Generalized Camera Models and Multi-view Geometry
Matthew Trager, Inria and École Normale Supérieure, France

10:30-10:55 The Multidegree of the Multi-image Variety
Laura Escobar, University of Illinois at Urbana-Champaign, USA

11:00-11:25 Two Hilbert Schemes in Computer Vision
Lucas van Meter, University of Washington, USA

11:30-11:55 Distortion Varieties
Bernd Sturmfels, Max Planck Institute Leipzig, Germany and University of California, Berkeley, USA

Monday, July 31
MS9
Algebra and Geometry in Frame Theory - Part I of II
10:00 AM-12:00 PM

Room:Skiles Building - 271

For Part 2 see MS19
Frame theory studies special vector arrangements which arise in numerous signal processing applications. Over the last decade, the need for frame-theoretic research has grown alongside the emergence of new methods in signal processing. Modern advances in frame theory involve techniques from algebraic geometry, semidefinite programming, algebraic and geometric combinatorics, and representation theory. This minisymposium will explore a multitude of these algebraic and geometric developments in frame theory.

Organizer: Nate Strawn
Duke University, USA

Organizer: Dustin Mixon
Air Force Institute of Technology, USA

Organizer: Emily King
Universität Bremen, Germany

10:00-10:25 An Overview of Applications of Algebra and Geometry to Frame Theory
Nate Strawn, Georgetown University, USA

10:30-10:55 New Bounds for Equiangular Lines and Spherical Two-distance Sets
Wei-Hsuan Yu, Michigan State University, USA

11:00-11:25 Equiangular Tight Frames from Association Schemes
Joseph Iverson, University of Maryland, USA; John Jasper, University of Cincinnati, USA; Dustin Mixon, Air Force Institute of Technology, USA

11:30-11:55 Classifying Complex Equiangular Tight Frames by Computational Algebraic Geometry
Ferenc Szöllosi, Aalto University, Finland

Monday, July 31
MS10
Symbolic Combinatorics - Part I of III
10:00 AM-12:00 PM

Room:Skiles Building - 168

For Part 2 see MS20
In recent years algorithms and software have been developed that allow researchers to discover and verify combinatorial identities as well as understand analytic and algebraic properties of generating functions. The interaction of combinatorics and symbolic computation has had a beneficial impact on both fields. This minisymposium will feature 12 speakers describing recent research combining these areas.

Organizer: Manuel Kauers
Johannes Kepler University, Austria

Organizer: Michael Singer
North Carolina State University, USA

Organizer: Shaoshi Chen
North Carolina State University, USA

Organizer: Stephen Melczer
University of Waterloo, Canada

10:00-10:25 Rational Solutions of Linear Mahler Equations
Frédéric Chyzak, Inria and École Normale Supérieure de Lyon, France; Thomas Dreyfus, Université Lyon I, France; *Philippe Dumas*, Inria, France; Marc Mezzarobba, Inria and Universite Lyon, AriC, LIP, France

10:30-10:55 Extreme Diagonally and Antidiagonally Symmetric Alternating Sign Matrices of Odd Order
Arvind Ayyer, Indian Institute of Science, Bangalore, India; Roger Behrend, Cardiff University, United Kingdom; *Ilse Fischer*, University of Vienna, Austria

11:00-11:25 Can You Count Genus 2 Surfaces in 3-Manifolds?
Stavros Garoufalidis, Georgia Institute of Technology, USA

11:30-11:55 Desingularization in Several Variables
Manuel Kauers, Johannes Kepler University, Austria

Monday, July 31

Lunch Break

12:00 PM-1:30 PM

Attendees on their own

IP2

On the Stability of Solutions in Numerical Algebraic Geometry

1:30 PM-2:30 PM

Room:Clough Undergraduate Learning Commons - 152

Chair: Teresa Krick, Universidad de Buenos Aires, Argentina

In the last years a number of results concerning the stability properties of the solutions to problems in Algebraic Geometry have proved that (in different situations) the so called condition number of a pair (problem instance, solution) can be expected to be quite small. The condition number of such a pair measures the variation of the solution when the problem instance is perturbed. This talk will use its more geometrical denition which sheds light on its properties and shows that it is often a measure of complexity. I will present some classical, some recent and some new results on the expected value of powers of the condition number in different situations. In particular, I will mention new results concerning the stability of the polynomial eigenvalue problem and that of sparse or lacunary polynomial solving. These results follow from the use of classical Algebraic Geometry theorems combined with tehcniques from integration in manifolds. There will be no much need of previous knowledge on any of these areas to follow the conference. This work summarizes a considerable number of papers by different people, including my coauthors D. Armentano, P. B urgisser, F. Cucker, J. P. Dedieu, J. G. Criado del Rey, A. Leykin, G. Malajovich, L. M. Pardo and M. Shub.

Carlos Beltrán
Universidad de Cantabria, Spain

Monday, July 31

Coffee Break

2:30 PM-3:00 PM

Room:Skiles Building

MS11

Applications of Computational Algebraic Geometry to Cryptology - Part II of III

3:00 PM-5:00 PM

Room:Skiles Building - 249

For Part 1 see MS1
For Part 3 see MS21
The goal of this minisymposium is to bring together experts in cryptology and in computational algebraic geometry to discuss the interaction of recent developments in algebraic computations and related problems arising in cryptology. A particular focus is put on algorithms for counting points on curves defined over finite fields, on algorithms for solving polynomial systems over finite fields, and on computational methods for post-quantum cryptography.

Organizer: Alessio Caminata
University of Barcelona, Spain

Organizer: Maike Massierer
University of New South Wales, Australia

Organizer: Pierre-Jean Spaenlehauer
Inria, France

3:00-3:25 Short Generators without Quantum Computers: The Case of Multiquadratics
Daniel J. Bernstein, University of Ilinois at Chicago, USA

3:30-3:55 Improving Complexity Bounds for Hyperelliptic Point-counting
Simon Abelard, Université de Lorraine, France; Pierrick Gaudry, CNRS, France; Pierre-Jean Spaenlehauer, Inria, France

4:00-4:25 Accelerating Point-counting Algorithms using Explicit Endomorphisms
Benjamin Smith, INRIA and Ecole Polytechnique, France

4:30-4:55 Improvements to Point Counting on Hyperelliptic Curves of Genus Two
Sean F. Ballentine, University of Maryland, USA; Aurore Guillevic, Inria Nancy - Grand Est, France; Elisa Lorenzo Garcia, Université de Rennes 1, France; Chloe Martindale, Universiteit Leiden, The Netherlands; *Maike Massierer*, University of New South Wales, Australia; Benjamin Smith, INRIA and Ecole Polytechnique, France; Jaap Top, University of Groningen, Netherlands

Monday, July 31

MS12

Algebraic and Geometric Methods in Discrete Optimization - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 268

For Part 1 see MS2

Ideas from algebra, number theory, and geometry and topology have influenced the way we think about algorithms for solving optimization problems with discrete constraints, i.e. integer, mixed integer and combinatorial problems. E.g., New methods such as Groebner bases gave an impulse for the design of new augmentation algorithms for integer programs. Similarly convex geometry arguments are used in the investigation of mixed integer programs. Non-linear constraints present in models highlight the importance of using methods from algebra and geometry too. In this symposium we discuss several fascinating instances of such tools of analysis.

Organizer: Jesus De Loera
University of California, Davis, USA

3:00-3:25 Some Cut-generating Functions for Second-order Conic Set

Santanu Dey, Georgia Institute of Technology, USA

3:30-3:55 Fast Submodular Function Minimization

Deeparnab Chakrabarty, Dartmouth College, USA

4:00-4:25 Automated Discovery of Cutting Plane Theorems and Semialgebraic Proofs

Matthias Koeppe and Yuan Zhou, University of California, Davis, USA

4:30-4:55 Ordered Sets in Discrete Optimization

Akshay Gupte, Clemson University, USA

Monday, July 31

MS13

Algorithms and Complexity in Real Algebraic Geometry - Part I of II

3:00 PM-5:00 PM

Room:Skiles Building - 255

For Part 2 see MS23

This minisymposium aims to present recent algorithmic and complexity results on real (and complex) polynomials and systems of polynomials. Some of the topics are root finding, connectivity algorithms, complexity of semi-algebraic sets, applications, etc.

Organizer: Eric Schost
University of Waterloo, Canada

Organizer: Mohab Safey El Din
Université Pierre et Marie Curie, France

3:00-3:25 On the Complexity of Deciding Connectivity Queries. Algorithms and Implementations

Eric Schost, University of Waterloo, Canada

3:30-3:55 On the Complexity of Root Clustering

Chee K. Yap, Courant Institute of Mathematical Sciences, New York University, USA

4:00-4:25 Computing Real Radicals of Polynomial Ideals

Zhihong Yang, University of Chinese Academy of Sciences, China; Lihong Zhi, Academia Sinica, China

4:30-4:55 Gram Spectrahedra

Daniel Plaumann, Technische Universität Dortmund, Germany

Monday, July 31

MS14

New Trends in Polynomial System Solving and Applications - Part II of III

3:00 PM-5:00 PM

Room:Skiles Building - 254

For Part 1 see MS4
For Part 3 see MS45

Polynomial systems arise in numerous areas of mathematics and computer science, such as control theory, geometric modeling, biochemistry, coding theory and cryptology, to name a few. Efficient and reliable solvers for polynomial systems are in the epicentre of applied algebraic geometry and computer algebra. Available tools for recovering the solutions include Groebner bases, characteristic sets, multivariate resultants as well as symbolic-numeric methods and subdivision-based solvers. Among the challenges which occur in the process is reliable root isolation, certification and approximation, treatment of singular solutions, the exploitation of structure coming from specific applications as well as the development of reliable software. The minisymposium will host presentations related to state-of-the-art solution strategies for these problems, theoretical and algorithmic advances as well as emerging application areas.

Organizer: Angelos Mantzaflaris
RICAM, Austrian Academy of Sciences, Austria

Organizer: Elias Tsigaridas
INRIA Paris, France

3:00-3:25 Semidefinite Programming and Numerical Algebraic Geometry

Jonathan Hauenstein, Alan Liddell, and Yi Zhang, University of Notre Dame, USA

3:30-3:55 Univariate Homotopy Continuation via Interval Arithmetic

Michael A. Burr, Fordham University, USA

4:00-4:25 Polynomial System Solving and Analytic Combinatorics in Several Variables

Stephen Melczer, University of Waterloo, Canada

4:30-4:55 Polynomial System Solving and Numerical Linear Algebra

Simon Telen and Marc Van Barel, Katholieke Universiteit Leuven, Belgium

Monday, July 31

MS15

From Approximation Theory to Tensor Decomposition - Part II of II

3:00 PM-4:30 PM

Room:Skiles Building - 270

For Part 1 see MS5

This minisymposium studies the connections among sparse interpolation, exponential analysis, rational approximation, orthogonal polynomials, generalized eigenvalue computation and tensor decompositions. We are aiming at a discussion among experts from the domains that are involved. This connection may have an impact on a large number of applications in computational science and engineering.

Organizer: Wen-shin Lee
University of Antwerp, Belgium

Organizer: Annie Cuyt
University of Antwerp, Belgium

Organizer: Mariya Ishteva
Vrije Universiteit Brussel, Belgium

Organizer: Ivan Markovsky
Vrije Universiteit Brussel, Belgium

3:00-3:25 From Pade Approximation to Tensor Decomposition

Annie Cuyt and *Wen-shin Lee*, University of Antwerp, Belgium

3:30-3:55 A Tensor Decomposition Method for Inverse Source Problems

Takaaki Nara and Tenyu Go, University of Tokyo, Japan

4:00-4:25 Computing Structured Matrix Factorizations with Applications in Tensor Decompositions and Blind Source Separation

Ignat Domanov, Otto Debals, and Lieven De Lathauwer, Katholieke Universiteit Leuven, Belgium

Monday, July 31

MS16

Polyhedral and Combinatorial Biology - Part II of IV

3:00 PM-5:00 PM

Room:Skiles Building - 005

For Part 1 see MS6
For Part 3 see MS26

We explore the role that combinatorial and polyhedral structures play in understanding biological phenomenon. The rapid grown in technology, means that the sophistication of the algorithms used to analyze discrete biological data lags behind the availability of data. Discrete mathematicians are encouraged to attend this session, to learn about applications of their tools to biology. Biologists are encourage to attend to ensure that mathematicians are focused on problems that remain relevant in the rapidly developing biological landscape. Mathematical objects such as convex polyhedral, cell complexes, trees and networks can be used to understand a wide range of biological phenomena. This session will feature exploration of RNA secondary structures, neural codes, genome rearrangements as well as bacterial, gene, and species evolution. These applications show demonstrate how topics traditionally confined to the pure mathematical cannon help explore living organisms. In addition, this session will examine how biology generates novel mathematical questions and objects, such as the structure of varieties associated to Markov models of evolution, or the enumeration of gene trees under the coalescent model.

Organizer: Joseph P. Rusinko
Hobart and William Smith Colleges, USA

3:00-3:25 Predicting Ecological Function in the Microbiome using Spectral Properties of Interacting Clades

Russell Y. Neches, University of California, Davis, USA

3:30-3:55 Efficient Quartet Systems

MaLyn Lawhorn, Winthrop University, USA

4:00-4:25 Enumeration of Gene Tree Configurations in Species Trees

Filippo Disanto, Stanford University, USA

4:30-4:55 New Perspectives on Rooted Trees and Parameter Spaces

Patricio Gallardo, University of Georgia, USA; Noah Giansiracusa, Swarthmore College, USA; Kenny Ascher, Brown University, USA; Evangelos Routis, Institute for the Physics and Mathematics of the Universe, Japan

Monday, July 31

MS17

Identifiability of Biological and Statistical Models - Part II of II

3:00 PM-4:30 PM

Room:Skiles Building - 006

For Part 1 see MS7

A model is identifiable if its underlying parameters can be recovered from accurate observations. Identifiability is a crucial property for a model for it to be deployed in data analysis, as this insures that parameter recovery procedures based on the model and the particular observations are valid. When the model is not identifiability, changes to the model parametrization or the observations need to be made. Identifiability analysis of many models can be made using tools from differential algebra, algebraic geometry, combinatorics, and differential geometry. This minisymposium will highlight these applications.

Organizer: Seth Sullivant
North Carolina State University, USA

Organizer: Nicolette Meshkat
Santa Clara University, USA

3:00-3:25 Algebraic Identifiability of Gaussian Mixtures

Carlos Amendola Ceron, Technische Universität Berlin, Germany

3:30-3:55 Identifiability of Species Phylogenies under a Modified Coalescent

Colby Long, Ohio State University, USA

4:00-4:25 Identifiability of a Multispecies Coalescent Model for the Evolution of k-mer Distances on a Phylogenetic Tree

Chris Durden, North Carolina State University, USA

Monday, July 31

MS18

Algebraic Vision - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 202

For Part 1 see MS8

Algebraic vision aims to explore the foundations of problems in computer vision using algebraic methods. The lectures in this session showcase recent results in this area.

Organizer: Rekha Thomas
University of Washington, USA

Organizer: Max Lieblich
University of Washington, USA

Organizer: Matthew Trager
Inria and École Normale Supérieure, France

3:00-3:25 Fast Groebner Basis Solvers for Computer Vision

Zuzana Kukelova, Czech Technical University, Prague, Czech Republic

3:30-3:55 Minimal Problems for the Calibrated Trifocal Variety

Joe Kileel, University of California, Berkeley, USA

4:00-4:25 Multi-focal Tensors from Invariant Differential Forms, and Line Envelopes for Structure-from-Motion

James Mathews, Stony Brook University, USA

4:30-4:55 The Nearest Point to a Variety Problem, Near the Variety

Diego Cifuentes, Massachusetts Institute of Technology, USA

Monday, July 31

MS19

Algebra and Geometry in Frame Theory - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 271

For Part 1 see MS9

Frame theory studies special vector arrangements which arise in numerous signal processing applications. Over the last decade, the need for frame-theoretic research has grown alongside the emergence of new methods in signal processing. Modern advances in frame theory involve techniques from algebraic geometry, semidefinite programming, algebraic and geometric combinatorics, and representation theory. This minisymposium will explore a multitude of these algebraic and geometric developments in frame theory.

Organizer: Nate Strawn
Duke University, USA

Organizer: Emily King
Universität Bremen, Germany

Organizer: Dustin Mixon
Air Force Institute of Technology, USA

3:00-3:25 Polytopes in Frame Theory and Representation Theory

Christoph Pegel, Universität Bremen, Germany

3:30-3:55 Spark Deficient Gabor Frames

Romanos D. Malikiosis, Technische Universität Berlin, Germany

4:00-4:25 On the Structure of Maximal 2nd Degree Levenschtein Frames

John Haas, University of Missouri, USA; Dustin Mixon and Nathaniel Hammen, Air Force Institute of Technology, USA

4:30-4:55 Equality Conditions for the Levenstein Bounds in Projective Space

John Haas, University of Missouri, USA; *Nathaniel Hammen* and Dustin Mixon, Air Force Institute of Technology, USA

Monday, July 31

MS20

Symbolic Combinatorics - Part II of III

3:00 PM-5:00 PM

Room:Skiles Building - 168

For Part 1 see MS10
For Part 3 see MS30
In recent years algorithms and software have been developed that allow researchers to discover and verify combinatorial identities as well as understand analytic and algebraic properties of generating functions. The interaction of combinatorics and symbolic computation has had a beneficial impact on both fields. This minisymposium will feature 12 speakers describing recent research combining these areas.

Organizer: Manuel Kauers
Johannes Kepler University, Austria

Organizer: Michael Singer
North Carolina State University, USA

Organizer: Shaoshi Chen
North Carolina State University, USA

Organizer: Stephen Melczer
University of Waterloo, Canada

3:00-3:25 On the Enumeration of Compacted Trees

Bernhard Gittenberger, Technische Universitaet Wien, Germany

3:30-3:55 Multivariate Algebraic Generating Functions: Asymptotics and Examples

Torin Greenwood, Georgia Institute of Technology, USA

4:00-4:25 Congruences Connecting Modular Forms and Truncated Hypergeometric Series

Armin Straub, University of South Alabama, USA

4:30-4:55 3-Dimensional Lattice Walks and Related Groups

Ronghua Wang, Johannes Kepler University, Austria; Qinghu Hou and kang Du, Tianjin University, China

Monday, July 31

PP1

Welcome Reception and Poster Session

5:00 PM-7:00 PM

Room:Klaus Advanced Computing Building

Sampling and Persistence Diagrams
Kathryn H. Heal, Harvard University, USA

Sixty-four Curves of Degree Six
Nidhi Kaihnsa and Mario Kummer, Max Planck Institute for Mathematics in the Sciences, Germany; Daniel Plaumann, Technische Universität Dortmund, Germany; Mahsa Sayyary and Bernd Sturmfels, Max Planck Institute for Mathematics in the Sciences, Germany

The Covering Problem via Convex Algebraic Geometry
Leonardo M. Mito and Gabriel Haeser, University of São Paulo, Brazil

Maximum Likelihood Estimate Homotopy Tracking for Toric Models
Evan Nash, Ohio State University, USA; Carlos Amendola, Technische Universität Berlin, Germany; Nathan Bliss, University of Ilinois at Chicago, USA; Serkan Hosten, San Francisco State University, USA; Jose I. Rodriguez, University of Chicago, USA

S-Arithmetic Groups in Quantum Computing
Sebastian Schoennenbeck, RWTH Aachen University, Germany; Vadym Kliuchnikov, Microsoft Research, USA

Gram Determinants of Real Binary Tensors
Anna Seigal, University of California, Berkeley, USA

Mixing Behavior of a Family of Random Walks Corresponding to an Integer Sequence
Caprice Stanley, North Carolina State University, USA

Metric Reconstruction Via Optimal Transport
Henry Adams, Colorado State University, USA; Florian Frick, Cornell University, USA; Michal Adamaszek, University of Copenhagen, Denmark

Identifying Species Hybridization Network Features from Gene Tree Quartets
Hector Banos, University of Alaska, Fairbanks, USA

Matroidal Root Structure of Skew Polynomials over Finite Fields
Travis A. Baumbaugh and Felice Manganiello, Clemson University, USA

The Positive Bergman Complex of An Oriented Matroid with Valuation
Marcel Celaya and Josephine Yu, Georgia Institute of Technology, USA

ReactionNetworks.m2 - A Package for Algebraic Systems Biology
Cvetelina Hill, Georgia Institute of Technology, USA; Elizabeth Gross, San Jose State University, USA; Timothy Duff, Georgia Institute of Technology, USA

Tensor Diagrams and Chebyshev Polynomials
Lisa Lamberti, ETH Zürich, Switzerland

Solving Polynomial System Using Package Monodromy Solver
Kisun Lee, Georgia Institute of Technology, USA

Computations over Local Rings in Macaulay2
Mahrud Sayrafi, University of California, Berkeley, USA; Michael Stillman, Cornell University, USA; David Eisenbud, Mathematical Sciences Research Institute, USA

Identifying Clusters of in-Control and Out-of-Control Parts in Manufacturing Processes Using Numerical Algebraic Geometry and Nonparametric Regression
Sara Shirinkam and Adel Alaeddini, University of Texas, San Antonio, USA; Elizabeth Gross, San Jose State University, USA

Tuesday, August 1

Registration
7:30 AM-4:00 PM

Room:Skiles Building - Bottom (0-th) Floor

Remarks
8:20 AM-8:30 AM

Room:Clough Undergraduate Learning Commons - 152

IP3
Algebraic Geometry for Geometric Modeling
8:30 AM-9:30 AM

Room:Clough Undergraduate Learning Commons - 152

Chair: Frank Sottile, Texas A&M University, USA

Geometric modeling studies mathematical methods for constructing objects in computer graphics and computer aided design. From early on, low degree polynomials and simple algebro-geometric tools were used. The advances of speed and memory of computer systems now permit the use of more tools from algebraic geometry. In particular, the building blocks of the constructions could include pieces of real, affine algebraic curves, surfaces, and threefolds, or higher degree splines, or toric varieties. In this talk, I will discuss various examples, drawing on results from the EU networks GAIA and SAGA.

Ragni Piene
University of Oslo, Norway

Coffee Break
9:30 AM-10:00 AM

Room:Skiles Building

Tuesday, August 1

MS21
Applications of Computational Algebraic Geometry to Cryptology - Part III of III
10:00 AM-12:00 PM

Room:Skiles Building - 249

For Part 2 see MS11

The goal of this minisymposium is to bring together experts in cryptology and in computational algebraic geometry to discuss the interaction of recent developments in algebraic computations and related problems arising in cryptology. A particular focus is put on algorithms for counting points on curves defined over finite fields, on algorithms for solving polynomial systems over finite fields, and on computational methods for post-quantum cryptography.

Organizer: Alessio Caminata
University of Barcelona, Spain

Organizer: Maike Massierer
University of New South Wales, Australia

Organizer: Pierre-Jean Spaenlehauer
Inria, France

10:00-10:25 Security Considerations for Galois Non-dual RLWE Families
Hao Chen and Kristin Lauter, Microsoft Research, USA; Katherine Stange, University of Colorado Boulder, USA

10:30-10:55 Multivariate Public Key Cryptosystems - Candidates for the Next Generation Post-quantum Standards
Jintai Ding, University of Cincinnati, USA

11:00-11:25 Cyclic SRP - Cryptanalysis of the SRP Encryption Scheme
Albrecht R. Petzoldt, National Institute of Standards and Technology, USA

11:30-11:55 Solving Degree of Multivariate Polynomial Systems and Castelnuovo-Mumford Regularity
Alessio Caminata, University of Barcelona, Spain; Elisa Gorla, University of Neuchatel, Switzerland

---

Tuesday, August 1

MS22
Newton-Okounkov Bodies and Khovanskii Bases - Part II of II
10:00 AM-11:30 AM

Room:Skiles Building - 006

For Part 1 see MS3

The theory of Newton-Okounkov bodies generalizes that of Newton Polytopes, giving a conceptual framework for root counts to systems of functions in terms of volumes and mixed volumes of convex Newton-Okounkov bodies. While the asymptotic definition of these bodies is not particularly constructive, when they admit a Khovanskii basis, they are polyhedral. Having a Khovanskii basis enables other methods based on polyhedra to be used. While Newton-Okounkov bodies arose to solve questions from pure mathematics they have significant potential in applications. These include providing a foundation for root counts for polynomial systems from applications, the use of these root counts and Khovanskii bases for solving, and a host of algorithmic questions involving computing/determining Newton-Okounkov bodies and Khovanskii bases. The purpose of this minisymposium is to explore some of these opportunities and to advertise this to the wider community of applied algebraic geometry.

Organizer: Frank Sottile
Texas A&M University, USA

10:00-10:25 Introduction to Khovanskii Bases, Valuations and Newton-Okounkov Bodies
Kiumars Kaveh, University of Pittsburgh, USA

10:30-10:55 Khovanskii Bases and Tropical Geometry
Chris Manon, George Mason University, USA

11:00-11:25 Initial Degenerations of the Grassmannian
Dan Corey, Yale University, USA

Tuesday, August 1

MS23

Algorithms and Complexity in Real Algebraic Geometry - - Part II of II

10:00 AM-12:00 PM

Room:Skiles Building - 255

For Part 1 see MS13
This minisymposium aims to present recent algorithmic and complexity results on real (and complex) polynomials and systems of polynomials. Some of the topics are root finding, connectivity algorithms, complexity of semi-algebraic sets, applications, etc.

Organizer: Eric Schost
University of Waterloo, Canada

Organizer: Mohab Safey El Din
Université Pierre et Marie Curie, France

10:00-10:25 On the Davenport-Mahler Bound
Daniel Perrucci and Paula Escorcielo, Universidad de Buenos Aires, Argentina

10:30-10:55 A Framework for Investigating Multistationarity in Messi Biochemical Systems
Xiaoxiao Tang, Texas A&M University, USA

11:00-11:25 Real Intersection Between a Low-degree Curve and a Sparse Hypersurface
Sebastien Tavenas, University of Savoy, France

11:30-11:55 Improved Bounds for Equivariant Betti Numbers of Symmetric Semi-algebraic Sets
Cordian Riener, Universität Konstanz, Germany; Saugata Basu, Purdue University, USA

Tuesday, August 1

MS24

Symmetry and Structure in Algebraic Computation - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 254

For Part 2 see MS34
The concept of symmetry arises both in nature, science, and art. From a computational perspective, symmetry allows to reduce the complexity of problems or organize their resolution. This idea appears in different guises and in different contexts, for a variety of applications. The minisymposium aims to present such instances.

Organizer: Cordian Riener
Universität Konstanz, Germany

Organizer: Evelyne Hubert
Inria Méditerranée, France

10:00-10:25 Multivariate Symmetric Interpolation and Subresultants
Agnes Szanto, North Carolina State University, USA

10:30-10:55 Fourier Transforms of Polytopes, Ehrhart and Solid Angle Sums for Real Polytopes, and Symmetric Simplices
Sinai Robins, University of Sao Paulo, Brazil

11:00-11:25 A Tale of Two Cones with Symmetry
Charu Goel and Salma Kuhlmann, Universität Konstanz, Germany; Bruce Reznick, University of Illinois at Urbana-Champaign, USA

11:30-11:55 Modules over FI-algebras
Robert Krone, Queen's University, Canada; Jan Draisma, University of Bern, Switzerland; Alexei Krasilnikov, Universidade de Brasília, Brazil

Tuesday, August 1

MS25

Decomposition and Identifiability of Real and Complex Tensors - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 270

For Part 2 see MS46
Tensors and their decompositions have found application in a wide variety of applications such as algebraic statistics, chemometrics, machine learning and signal processing, among others. Many popular ways of sparsely representing tensors, such as the tensor rank, Waring, Chow, Hierarchical Tucker and Tensor Trains decompositions, naturally admit the structure of projective algebraic varieties over the complex field. Considering these decompositions over the reals, they become either real projective algebraic varieties or semi-algebraic sets. This minisymposium features talks on the properties of real and complex tensor decompositions and their interconnections.

Organizer: Luca Chiantini
Università di Siena, Italy

Organizer: Giorgio Ottaviani
University of Firenze, Italy

Organizer: Nick Vannieuwenhoven
Katholieke Universiteit Leuven, Belgium

10:00-10:25 Identifiability for Skew Symmetric Tensors
Alessandra Bernardi, Università di Torino, Italy; Davide Vanzo, University of Firenze, Italy

10:30-10:55 Points of High Rank
Jaroslaw Buczynski, University of Warsaw, Poland

11:00-11:25 Taking a Step from the Waring Rank Toward the Chow Rank
Hirotachi Abo, University of Idaho, USA; Nick Vannieuwenhoven, Katholieke Universiteit Leuven, Belgium

11:30-11:55 Real Identifiability vs Complex Identifiability
Cristiano Bocci, Elena Angelini, and Luca Chiantini, Università di Siena, Italy

Tuesday, August 1

MS26

Polyhedral and Combinatorial Biology - Part III of IV

10:00 AM-12:00 PM

Room:Skiles Building - 005

For Part 2 see MS16
For Part 4 see MS56

We explore the role that combinatorial and polyhedral structures play in understanding biological phenomenon. The rapid grown in technology, means that the sophistication of the algorithms used to analyze discrete biological data lags behind the availability of data. Discrete mathematicians are encouraged to attend this session, to learn about applications of their tools to biology. Biologists are encourage to attend to ensure that mathematicians are focused on problems that remain relevant in the rapidly developing biological landscape. Mathematical objects such as convex polyhedral, cell complexes, trees and networks can be used to understand a wide range of biological phenomena. This session will feature exploration of RNA secondary structures, neural codes, genome rearrangements as well as bacterial, gene, and species evolution. These applications show demonstrate how topics traditionally confined to the pure mathematical cannon help explore living organisms. In addition, this session will examine how biology generates novel mathematical questions and objects, such as the structure of varieties associated to Markov models of evolution, or the enumeration of gene trees under the coalescent model.

Organizer: Joseph P. Rusinko
Hobart and William Smith Colleges, USA

10:00-10:25 Polyhedra, Sampling Algorithms for Random Polygons, and Applications to Ring Polymer Models
Clayton Shonkwiler, Colorado State University, USA

10:30-10:55 Polyhedral Complexes in Phylogenetics and Gene Interaction Studies
Alex Gavryushkin, ETH Zürich, Switzerland

11:00-11:25 The Structure of the Branching Polytopes for {RNA} Structures
Svetlana Poznanović, Clemson University, USA; Christine Heitsch and Fidel Barrera-Cruz, Georgia Institute of Technology, USA

11:30-11:55 Complexity of Models for Genome Rearrangement
Istvan Miklos, Renyi Institute, Hungary; *Heather C. Smith*, Georgia Institute of Technology, USA

Tuesday, August 1

MS27

Minisymposium on Statistics and Applied Algebraic Topology - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 202

For Part 2 see MS37

A burgeoning area of research in Applied Topology has been Stochastic Analysis and Modeling of topological summaries of data; we will term this research area as TDA. TDA generates interest across mathematics, statistics, computer science, and electrical engineering communities. Applications of TDA range from neuroscience, to networks analysis, to genetics, and more. One of the many challenges in modern data analysis is the ubiquity of high-dimensional data with growing complexity. A central challenge in modeling these data is representing them in a way that is amenable to classical methods of statistical analysis. For example, many of the problems can be formalized in the following general settings: a collection of noisy scientific data are observed in a high-dimensional ambient space, but are in fact generated by a stochastic process that is concentrated around a lower-dimensional space. Recovering the lower-dimensional system is extremely challenging. TDA focuses on recovering topological summaries, facilitating the detection of subtle features missed by other approaches. The proposed minisymposium focuses on statistical and probabilistic aspects of TDA. We will exhibit talks that range from asymptotic properties of topological estimators to applied case studies in cancer biology and geometric morphometrics. These talks will also relate the relatively new theory and methodology to more classic theory such as extrema of random fields and estimates of contours.

Organizer: Brittany Fasy
Montana State University, USA

Organizer: Sayan Mukherjee
Duke University, USA

Tuesday, August 1

MS27

Minisymposium on Statistics and Applied Algebraic Topology - Part I of II

10:00 AM-12:00 PM

continued

10:00-10:25 The Consistency of Gibbs Posteriors and the Thermodynamic Formalism

Sayan Mukherjee, Duke University, USA

10:30-10:55 The DTM-signature for a Geometric Comparison of Metric-measure Spaces from Samples

Claire Brecheteau, Inria, France

11:00-11:25 Topological Similarity of Random Cell Complexes

Benjamin Schweinhart, Ohio State University, USA

11:30-11:55 Pseudo-multidimensional Persistence and its Applications

Giseon Heo, University of Alberta, Canada; Catalina Betancourt, University of Iowa, USA; Rachel Neville, Colorado State University, USA; Matthew Pietrosa, University of Alberta, Canada; Mimi Tsuruga, University of California, Davis, USA; Isabel Darcy, University of Iowa, USA

Tuesday, August 1

MS28

Algebraic Methods in Rigidity Theory - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 268

For Part 2 see MS38

The classical subject of study in rigidity theory is a framework consisting of finitely many rigid bars attached at universal joints, and the fundamental question is to determine if a framework is rigid or flexible. More general frameworks involve other types of geometric constraints and arise in applications including robotics, computer-aided design, and structural biology. Our goal is to bring together researchers with complementary interests in applied algebraic geometry, rigidity theory, algebraic matroids, and matrix completion problems to share methods and problems.

Organizer: Jessica Sidman
Mount Holyoke College, USA

Organizer: Louis Theran
University of St. Andrews, United Kingdom

Organizer: Meera Sitharam
University of Florida, USA

10:00-10:25 Surveying Applications of Rigidity Theory

Audrey St. John, Mount Holyoke College, USA

10:30-10:55 Algebraic Geometry and Mechanism Science: Recent Results and Open Problems

Hans-Peter Schröcker, University of Innsbruck, Austria

11:00-11:25 Grassmannians, Invariant Theory and the Bracket Algebra in Rigidity Theory

Will Traves, US Naval Academy, USA; Jessica Sidman, Mount Holyoke College, USA

11:30-11:55 The Pure Condition Through the Lens of the Algebraic Matroid

Zvi H. Rosen, University of Pennsylvania, USA

Tuesday, August 1

MS29

Applications of Algebra to Signal Processing and Digital Imaging - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 271

For Part 2 see MS39

Many problems in this increasingly digital world can be studied through the tools of algebra and algebraic geometry, and can be encoded in the language of tensors. This minisymposium is focused on problems arising in applications of tensors to signal processing and digital imaging. Mathematicians have studied tensors through tools of algebraic geometry, uncovering connections to many classical problems. Practitioners have studied tensors through iterative algorithmic methods. There is an increasing need to understand these algorithms from an algebraic viewpoint, and to understand the boundary cases (when and why the algorithms fail). Unfortunately there is still a lack of communication between mathematicians and engineers in this area. Through this minisymposium we will showcase applications of algebraic geometry to problems in the digital world, interchange our terminology, tools, and related results in a common language. Our goal is that this activity will help the participants to learn new tools, techniques and applications as well as to identify new interdisciplinary collaborations.

Organizer: Cristiano Bocci
Università di Siena, Italy

Organizer: Cameron L. Farnsworth
Yonsei University, South Korea

Organizer: Luke Oeding
Auburn University, USA

10:00-10:25 A Rectangular Relaxation for Multi-D Filter Bank Design using Laurent Polynomials

Cameron L. Farnsworth and Youngmi Hur, Yonsei University, South Korea

10:30-10:55 Low Rank Tensor Approximation via Sparse Optimization for Video Processing

Carmeliza Navasca, University of Alabama at Birmingham, USA; Xioafei Wang, Northeast University, China

11:00-11:25 Global Optimality in Matrix and Tensor Factorization

Rene Vidal, Johns Hopkins University, USA

11:30-11:55 A New Generation of Brain-computer Interfaces Driven by Discovery of Latent EEG-fMRI Linkages using Tensor Decomposition

Gopikrishna Desphande, Auburn University, USA; D Rangaprakash, University of California, Los Angeles, USA; *Luke Oeding*, Auburn University, USA; Andrzej Cichocki, RIKEN Brain Science Institute, Japan; Xiaoping P. Hu, University of California, Riverside, USA

Tuesday, August 1

MS30

Symbolic Combinatorics - Part III of III

10:00 AM-12:00 PM

Room:Skiles Building - 168

For Part 2 see MS20

In recent years algorithms and software have been developed that allow researchers to discover and verify combinatorial identities as well as understand analytic and algebraic properties of generating functions. The interaction of combinatorics and symbolic computation has had a beneficial impact on both fields. This minisymposium will feature 12 speakers describing recent research combining these areas.

Organizer: Manuel Kauers
Johannes Kepler University, Austria

Organizer: Michael Singer
North Carolina State University, USA

Organizer: Shaoshi Chen
North Carolina State University, USA

Organizer: Stephen Melczer
University of Waterloo, Canada

10:00-10:25 Asymptotic Enumeration of Weighted Lattice Paths

Marni Mishna, Simon Fraser University, Canada

10:30-10:55 Hermite Reduction in Logarithmic and Exponential Extensions

Ziming Li, Chinese Academy of Sciences, China

11:00-11:25 New Advances in Enumerating Lattice Walks through Rational Diagonals

Stephen Melczer, University of Waterloo, Canada

11:30-11:55 The Method of Differential Approximation in Enumerative Combinatorics

Jay Pantone, Dartmouth College, USA

Tuesday, August 1

MS31

Algebraic Geometry Methods for Discrete Dynamical Systems - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 170

For Part 2 see MS41

Mathematical methods for prediction and control of the behavior of biological networks are diverse and draw from a wide variety of fields. Discrete dynamical systems have been increasingly successful in modeling biological networks and algebraic geometry has been identified as a powerful tool for studying them. Many theoretical results have been developed on their structural and dynamical properties but numerous open problems still remain. This minisymposium will focus on both current developments and open questions on application of methods in algebraic geometry for construction and analysis of discrete dynamical system models. It will cover applications to a wide range of problems, many of which in mathematical biology. The goal is to bring together mathematicians working in algebraic geometry who focus on discrete mathematical biology and related areas, to promote active interaction and exchange of ideas, and to identify open problems and strategies for addressing them. We will attract a diverse group of participants including senior and junior researchers; in addition, women mathematicians will be significantly represented.

Organizer: Elena S. Dimitrova
Clemson University, USA

Organizer: Matthew Macauley
Clemson University, USA

Organizer: David Murrugarra
University of Kentucky, USA

Tuesday, August 1

MS31

Algebraic Geometry Methods for Discrete Dynamical Systems - Part I of II

10:00 AM-12:00 PM

continued

10:00-10:25 Algebraic Methods for the Control of Boolean Networks

David Murrugarra, University of Kentucky, USA

10:30-10:55 Emergent Dynamics from Network Connectivity: A Minimal Model

Carina Curto, Pennsylvania State University, USA

11:00-11:25 Algebraic Geometry of K-canalizing Functions

Qijun He, Virginia Tech, USA

11:30-11:55 Reverse-engineering Threshold Networks From Boolean Data

Abdul Salam Jarrah, American University of Sharjah, United Arab Emirates

Tuesday, August 1

CP1

Solving Equations

10:00 AM-11:30 AM

Room:Skiles Building - 171

Chair: Jonathan Hauenstein, University of Notre Dame, USA

10:00-10:25 Computing Real Equilibria of Kuramoto Model

Owen Coss and Hoon Hong, North Carolina State University, USA; Jonathan Hauenstein, University of Notre Dame, USA; Daniel Molzahn, Argonne National Laboratory, USA

10:30-10:55 Solving the Polynomial Equations by Algorithms of Power Geometry

Alexander D. Bruno, Keldysh Institute for Applied Mathematics, RAS, Russia; *Alexander B. Batkhin*, Keldysh Institute of Applied Mathematics of RAS, Russia and Moscow Institute of Physics and Technology, Russia

11:00-11:25 Effective Methods for Proving the Consistency of Differential Equations

Richard S. Gustavson, City University of New York Graduate Center, USA; Omar Leon Sanchez, University of Manchester, United Kingdom

Lunch Break

12:00 PM-1:30 PM

Attendees on their own

Tuesday, August 1

IP4

Polynomial Dynamical Systems, Toric Differential Inclusions, and the Global Attractor Conject

1:30 PM-2:30 PM

Room:Clough Undergraduate Learning Commons - 152

Chair: Alicia Dickenstein, Universidad de Buenos Aires, Argentina

Polynomial dynamical systems (i.e., systems of differential equations with polynomial right-hand sides) appear in many important problems in mathematics and applications. For example, Hilbert's 16th problem involves counting limit cycles of two-dimensional polynomial dynamical systems (and is still largely unsolved). Also, some of the best known chaotic dynamical systems (such as the Lorenz system) are polynomial dynamical systems. In applications, biological interaction networks and chemical reaction networks often give rise to polynomial dynamical systems. The Global Attractor Conjecture was formulated in the 1970s, and claims that the solutions of a large class of polynomial systems (called toric dynamical systems) converge to a globally attracting point. In particular, according to this conjecture, toric dynamical systems cannot give rise to limit cycles or chaotic dynamics. We introduce toric differential inclusions, which are piecewise constant differential inclusions with right-hand side given by polyhedral cones, and discuss about how toric dynamical systems can be embedded into toric differential inclusions, and this embedding can be used to prove the Global Attractor Conjecture. The proof uses n-dimensional polyhedral fans, polyhedral partitions and convex geometry. We will also discuss about some connections with the Boltzmann equation, and applications of these results to understanding robustness and homeostasis in biological interaction networks.

Gheorghe Craciun
University of Wisconsin, Madison, USA

Tuesday, August 1

Coffee Break

2:30 PM-3:00 PM

Room:Skiles Building

MS32

Real Algebraic Geometry and Optimization - Part I of III

3:00 PM-5:00 PM

Room:Skiles Building - 249

For Part 2 see MS43

The minisymposium presents recent developments in the interplay of real algebraic geometry and optimization. Topics include positive polynomials, sums of squares, sums of non-negative circuits, semidefinite and geometric programming, polynomial optimization, signomial optimization, growth of polynomial functions, symmetries, and spectrahedra.

Organizer: Thorsten Theobald
Goethe Universität Frankfurt, Germany

Organizer: Timo de Wolff
Texas A&M University, USA

3:00-3:25 Symmetric Sums of Squares

Annie Raymond, University of Washington, USA; James Saunderson, Monash University, Australia; Mohit Singh, Georgia Institute of Technology, USA; Rekha Thomas, University of Washington, USA

3:30-3:55 Current Key Problems on Sums of Nonnegative Circuit Polynomials

Timo de Wolff, Texas A&M University, USA

4:00-4:25 Optimization with Invariance Constraints

Amir Ali Ahmadi, Princeton University, USA; Oktay Gunluk, IBM T.J. Watson Research Center, USA

4:30-4:55 On Coercivity of Polynomials

Tomas Bajbar, Goethe Universität Frankfurt, Germany

Tuesday, August 1

MS33

Algorithms and Implementation in Numerical Algebraic Geometry - Part I of II

3:00 PM-5:00 PM

Room:Skiles Building - 255

For Part 2 see MS44

The foundation of algebraic geometry is the problem of solving systems of polynomial equations. Numerical methods can be used to perform algebraic geometric computations forming the field of numerical algebraic geometry which continues to advance rapidly. The continuing progress in computer hardware and software has enabled new algorithms and implementations. Examples include irreducible decompositions in multi-projective spaces, and numerical techniques for computing discrete objects such as polytopes. This session will feature recent progress in algorithms and implementations of theoretical advances in numerical algebraic geometry.

Organizer: Tianran Chen
Auburn University Montgomery, USA

3:00-3:25 The Method of Gauss-Newton to Compute Power Series Solutions of Polynomial Homotopies

Nathan Bliss and Jan Verschelde, University of Ilinois at Chicago, USA

3:30-3:55 Numerical Irreducible Decomposition for Likelihood Equations

Jose I. Rodriguez, University of Chicago, USA

4:00-4:25 Hybridization of Bertini and the RegularChains Maple Library

Jesse W. Drendel, Colorado State University, USA

4:30-4:55 Least Squares Modeling in Numerical Algebraic Computation

Zhonggang Zeng, Northeastern Illinois University, USA

Tuesday, August 1

MS34

Symmetry and Structure in Algebraic Computation - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 254

For Part 1 see MS24

The concept of symmetry arises both in nature, science, and art. From a computational perspective, symmetry allows to reduce the complexity of problems or organize their resolution. This idea appears in different guises and in different contexts, for a variety of applications. The minisymposium aims to present such instances.

Organizer: Cordian Riener
Universität Konstanz, Germany

Organizer: Evelyne Hubert
Inria Méditerranée, France

3:00-3:25 Separating Invariants and Applications

Emilie Dufresne, University of Nottingham, United Kingdom

3:30-3:55 Rational Invariants for Orthogonal Equivalence of Homogeneous Polynomials

Paul Görlach, Max Planck Institute for Mathematics in the Sciences, Germany; Evelyne Hubert, Inria Méditerranée, France

4:00-4:25 Local Invariant Sets of Polynomial and Analytic Vector Field

Niclas Kruff, RWTH Aachen University, Germany

4:30-4:55 Symmetry Preserving Lagrange-hermite Interpolation

Evelyne Hubert, Inria Méditerranée, France; Cordian Riener, Universität Konstanz, Germany

Tuesday, August 1

MS35

Tensors: from Algebra to Applications - Part I of IV

3:00 PM-5:00 PM

Room:Skiles Building - 270

For Part 2 see MS57

Tensors are a rapidly growing area of research in mathematics. Their theoretical study involves algebraic and geometric tools, and they are closely linked to applications in data science, statistics and more. This minisymposium gathers researchers who use algebraic methods to study tensors, and connect this insight to applications. We will hear talks on the spectral theory of tensors, a range of tensor decomposition and representation, computational studies of tensors, as well as connections to biological data analysis and machine learning.

Organizer: Elina Robeva
Massachusetts Institute of Technology, USA

Organizer: Anna Seigal
University of California, Berkeley, USA

3:00-3:25 On a Proof of the Set-theoretic Version of the Salmon Conjecture - Part I

Shmuel Friedland, University of Illinois, Chicago, USA

3:30-3:55 On a Proof of the Set-theoretic Version of the Salmon Conjecture - Part II

Shmuel Friedland, University of Illinois, Chicago, USA

4:00-4:25 Tensor Network Ranks

Ke Ye and Lek-Heng Lim, University of Chicago, USA

4:30-4:55 Multi-tensor Decompositions for Personalized Cancer Diagnostics and Prognostics

Orly Alter, University of Utah, USA

Tuesday, August 1

MS36

Biological Algebraic Statistics - Part I of III

3:00 PM-5:00 PM

Room:Skiles Building - 005

For Part 2 see MS47

Algebraic statistics is a growing research area, and has recently been applied to several different problems from biology. One of the primary biological application areas is phylogenetics, the study of evolutionary histories of sets of organisms. The improvement of genetic sequencing technologies has led to a exponential increase in the amount of evolutionary data, requiring and allowing for new mathematical and statistics methods for its analysis. This minisymposium will bring together researchers who apply algebraic statistics techniques, interpreted very broadly, to a variety of biological problems.

Organizer: Megan Owen
Lehman College, CUNY, USA

Organizer: Ruriko Yoshida
Naval Postgraduate School, USA

3:00-3:25 Introduction to Biological Algebraic Statistics

Megan Owen, Lehman College, CUNY, USA

3:30-3:55 Toric Ideals of Neural Codes

Nida K. Obatake, Texas A&M University, USA; Elizabeth Gross, San Jose State University, USA; Nora Youngs, Colby College, USA

4:00-4:25 Genome-wide Phylogenomic Analysis Method Using Likelihood Ratios

Qiwen Kang, Christopher Schardl, and Neil Moore, University of Kentucky, USA; Ruriko Yoshida, Naval Postgraduate School, USA

4:30-4:55 Dimensionality Reduction via Tropical Geometry

Ruriko Yoshida, Naval Postgraduate School, USA; *Xu Zhang*, University of Kentucky, USA

Tuesday, August 1

MS37

Minisymposium on Statistics and Applied Algebraic Topology - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 202

For Part 1 see MS27

A burgeoning area of research in Applied Topology has been Stochastic Analysis and Modeling of topological summaries of data; we will term this research area as TDA. TDA generates interest across mathematics, statistics, computer science, and electrical engineering communities. Applications of TDA range from neuroscience, to networks analysis, to genetics, and more. One of the many challenges in modern data analysis is the ubiquity of high-dimensional data with growing complexity. A central challenge in modeling these data is representing them in a way that is amenable to classical methods of statistical analysis. For example, many of the problems can be formalized in the following general settings: a collection of noisy scientific data are observed in a high-dimensional ambient space, but are in fact generated by a stochastic process that is concentrated around a lower-dimensional space. Recovering the lower-dimensional system is extremely challenging. TDA focuses on recovering topological summaries, facilitating the detection of subtle features missed by other approaches. The proposed minisymposium focuses on statistical and probabilistic aspects of TDA. We will exhibit talks that range from asymptotic properties of topological estimators to applied case studies in cancer biology and geometric morphometrics. These talks will also relate the relatively new theory and methodology to more classic theory such as extrema of random fields and estimates of contours.

Organizer: Brittany Fasy
Montana State University, USA

Organizer: Sayan Mukherjee
Duke University, USA

3:00-3:25 Topological Summaries of Tumor Images Improve Prediction of Disease Free Survival in Glioblastoma Multiforme

Lorin Crawford, Duke University, USA; Anthea Monod and Andrew Chen, Columbia University, USA; Sayan Mukherjee, Duke University, USA; Raul Rabadan, Columbia University, USA

3:30-3:55 Approximation and Geometry of the Reach

Eddie Aamari, Universite de Paris-Sud, France; Jisu Kim, Carnegie Mellon University, USA; Frédéric Chazal, Inria Saclay Ile-de-France, France; Bertrand Michel, École centrale de Nantes, France; Alessandro Rinaldo and Larry Wasserman, Carnegie Mellon University, USA

4:00-4:25 The Geometry of Synchronization Problems and Learning Group Actions

Tingran Gao, Duke University, USA; Jacek Brodzki, University of Southampton, United Kingdom; Sayan Mukherjee, Duke University, USA

4:30-4:55 The Least Squares Klein Bottle For Image Patches

Brad Nelson and Gunnar Carlsson, Stanford University, USA

Tuesday, August 1

MS38

Algebraic Methods in Rigidity Theory - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 268

For Part 1 see MS28

The classical subject of study in rigidity theory is a framework consisting of finitely many rigid bars attached at universal joints, and the fundamental question is to determine if a framework is rigid or flexible. More general frameworks involve other types of geometric constraints and arise in applications including robotics, computer-aided design, and structural biology. Our goal is to bring together researchers with complementary interests in applied algebraic geometry, rigidity theory, algebraic matroids, and matrix completion problems to share methods and problems.

Organizer: Jessica Sidman
Mount Holyoke College, USA

Organizer: Louis Theran
University of St. Andrews, United Kingdom

Organizer: Meera Sitharam
University of Florida, USA

3:00-3:25 Body-and-cad Rigidity

Jessica Sidman, Mount Holyoke College, USA

3:30-3:55 Generic Global and Universal Rigidity

Louis Theran, University of St. Andrews, United Kingdom

4:00-4:25 Tropical Geometry for Rigidity Theory and Matrix Completion

Daniel I. Bernstein, North Carolina State University, USA

4:30-4:55 Discriminants and Exceptional Configurations of Bar-and-joint Frameworks

Zvi H. Rosen, University of Pennsylvania, USA; Jessica Sidman, Mount Holyoke College, USA; Louis Theran, University of St. Andrews, United Kingdom; *Cynthia Vinzant*, North Carolina State University, USA

Tuesday, August 1

MS39

Applications of Algebra to Signal Processing and Digital Imaging - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 271

For Part 1 see MS29

Many problems in this increasingly digital world can be studied through the tools of algebra and algebraic geometry, and can be encoded in the language of tensors. This minisymposium is focused on problems arising in applications of tensors to signal processing and digital imaging. Mathematicians have studied tensors through tools of algebraic geometry, uncovering connections to many classical problems. Practitioners have studied tensors through iterative algorithmic methods. There is an increasing need to understand these algorithms from an algebraic viewpoint, and to understand the boundary cases (when and why the algorithms fail). Unfortunately there is still a lack of communication between mathematicians and engineers in this area. Through this minisymposium we will showcase applications of algebraic geometry to problems in the digital world, interchange our terminology, tools, and related results in a common language. Our goal is that this activity will help the participants to learn new tools, techniques and applications as well as to identify new interdisciplinary collaborations.

Organizer: Cristiano Bocci
Università di Siena, Italy

Organizer: Cameron L. Farnsworth
Yonsei University, South Korea

Organizer: Luke Oeding
Auburn University, USA

3:00-3:25 Identifiability: The Uniqueness of the Reconstruction

Luca Chiantini, Università di Siena, Italy

3:30-3:55 Algebraic Geometry in Wavelet Construction

Youngmi Hur, Yonsei University, South Korea

Tuesday, August 1

MS39

Applications of Algebra to Signal Processing and Digital Imaging - Part II of II

3:00 PM-5:00 PM

continued

4:00-4:25 Modelling User Feedback in Recommender Systems: Tensor-based Approach

Evgeny Frolov and Ivan Oseledets, Skolkovo Institute of Science and Technology, Russia

4:30-4:55 Identifiability of An X-rank Decomposition of Polynomial Maps

Pierre Comon, Gipsa-Lab, France; *Yang Qi*, University of Chicago, USA; Konstantin Usevich, Gipsa-Lab, France

Tuesday, August 1

MS40

Symmetric Simplicial Complexes and Polytopes - Part I of III

3:00 PM-5:00 PM

Room:Skiles Building - 168

For Part 2 see MS51

This session features talks related to group actions on cell complexes, convex bodies, etc. in discrete geometry, topological combinatorics, computational topology, and nearby areas. Sample topics include (but are not limited to) (i) symmetric simplicial complexes, which appear in topological combinatorics such as in the evasiveness conjecture or intersection problems of Tverberg-type (ii) Vietoris-Rips and Cech simplicial complexes arising from metric spaces with group actions (iii) symmetric polytopes and orbitopes, such as cyclic polytopes and Caratheodory orbitopes (iv) Dirichlet sterohedra (polyhedra which tile space under the action of a group of motions). Our goal would be to consolidate these topics that study simplicial complexes and convex bodies with group actions and employ combinatorial-geometric reasoning in the presence of symmetries. These are closely related and more connections have recently been established. For instance, symmetric polytopes recently appeared in the study of Cech complexes of the circle. Thus we feel that now would be the right time and SIAM AG17 would be the right venue to bring together the experts in the area to foster collaborations and provide an opportunity for participants to learn about the relevant methods employed by researchers working on related problems.

Organizer: Henry Adams
Colorado State University, USA

Organizer: Florian Frick
Cornell University, USA

3:00-3:25 Mogami Constructions of Manifolds from Trees of Tetrahedra

Bruno Benedetti, University of Miami, USA

3:30-3:55 Equivariant Matroid Theory

Emanuele Delucchi, University of Fribourg, Switzerland

4:00-4:25 Low Rank Vector Bundles and Simplicial Complexes with Symmetry

Chris Peterson, Colorado State University, USA

4:30-4:55 The Convex Hull of Two Circles in R^3

Evan D. Nash, Ohio State University, USA; *Ata F. Pir*, Frank Sottile, and Li Ying, Texas A&M University, USA

Tuesday, August 1

MS41

Algebraic Geometry Methods for Discrete Dynamical Systems - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 170

For Part 1 see MS31

Mathematical methods for prediction and control of the behavior of biological networks are diverse and draw from a wide variety of fields. Discrete dynamical systems have been increasingly successful in modeling biological networks and algebraic geometry has been identified as a powerful tool for studying them. Many theoretical results have been developed on their structural and dynamical properties but numerous open problems still remain. This minisymposium will focus on both current developments and open questions on application of methods in algebraic geometry for construction and analysis of discrete dynamical system models. It will cover applications to a wide range of problems, many of which in are mathematical biology. The goal is to bring together mathematicians working in algebraic geometry who focus on discrete mathematical biology and related areas, to promote active interaction and exchange of ideas, and to identify open problems and strategies for addressing them. We will attract a diverse group of participants including senior and junior researchers; in addition, women mathematicians will be significantly represented.

Organizer: Elena S. Dimitrova
Clemson University, USA

Organizer: Matthew Macauley
Clemson University, USA

Organizer: David Murrugarra
University of Kentucky, USA

3:00-3:25 Turing, a Software Package with Crowd-sourcing Capabilities for the Analysis of Finite Polynomial Dynamical Systems

Reinhard Laubenbacher, University of Connecticut Health Center, USA

3:30-3:55 Model-dependent and Model-independent Control of Biological Network Models

Jorge Zanudo, Reka Albert, and Gang Yang, Pennsylvania State University, USA

4:00-4:25 On the Perfect Reconstruction of the Topology of Dynamic Networks

Alan Veliz-Cuba, University of Dayton, USA

4:30-4:55 Model Selection Strategies in Biological Network Inference via Groebner Bases

Brandilyn Stigler, Southern Methodist University, USA

Tuesday, August 1

CP2

Coding Theory

3:00 PM-5:00 PM

Room:Skiles Building - 171

Chair: David Cox, Amherst College, USA

3:00-3:25 On the Remaining Heuristics of the DLP Algorithm in Small Characteristic

Giacomo Micheli, University of Oxford, United Kingdom

3:30-3:55 Multi-point AG Codes on the GK Maximal Curve

Daniele Bartoli, University of Perugia, Italy; Maria Montanucci, Università degli Studi della Basilicata, Italy; Giovanni Zini, Universita' di Ferrara, Italy

4:00-4:25 $F_4(v)$-Double Cyclic Codes

Srinivasulu Bathala and Maheshanand Bhaintwal, Indian Institute of Technology Roorkee, India

4:30-4:55 Layered Codes Through Multilinear Algebra

Iwan Duursma, University of Illinois at Urbana-Champaign, USA

Intermission

5:00 PM-5:15 PM

SIAGA Journal Presentation

(Presenter: Bernd Sturmfels, University of California, Berkeley)

5:15 PM-6:15 PM

Room:Clough Undergraduate Learning Commons - 152

Wednesday, August 2

Registration
7:30 AM-4:00 PM

Room:Skiles Building - Bottom (0-th) Floor

Remarks
8:20 AM-8:30 AM

Room:Clough Undergraduate Learning Commons - 152

IP5
Stochastic Geometry with Topological Flavor
8:30 AM-9:30 AM

Room:Clough Undergraduate Learning Commons - 152

Chair: Dmitriy Morozov, Lawrence Berkeley National Laboratory, USA

Mapping the simplices of a Delaunay mosaic to their radii, we generically get a (generalized) discrete Morse function. Assuming a stationary Poisson point process, we extend classic results in stochastic geometry and compute the expected number of critical simplices and intervals in the discrete gradient as functions of the maximum radius. We obtain similar results for Delaunay mosaics under the Fisher information metric, for weighted Delaunay mosaics, and for other related complexes.

Herbert Edelsbrunner
IST Austria, Klosterneuburg, Austria

Coffee Break
9:30 AM-10:00 AM

Room:Skiles Building

Wednesday, August 2

MS42
Algebraic Coding for Storage Applications - Part I of II
10:00 AM-12:00 PM

Room:Skiles Building - 202

For Part 2 see MS53

Efficient coding of data for applications in distributed storage gives rise to new problems in coding theory. The main topic of the minisymposium is that of algebro-geometric methods in data coding that support efficient recovery of data stored on failed nodes in the system. Recently, codes on algebraic curves have been shown to enable local recovery of the data, and current research is focused on constructions and properties of locally recoverable codes from different families of curves and higher-dimensional varieties. We plan to cover these constructions in several talks of the symposium. Recent research in coding for storage also includes algebraic constructions of codes that perform local recovery based on a small part of a codeword (regenerating codes), as well as locality properties of known families of algebraic codes, starting with the classic Reed-Solomon codes. The symposium will include talks on local repair of this and other related families such as codes on Hermitian curves.

Organizer: Anthony Varilly Alvarado
Rice University, USA

Organizer: Alexander Barg
University of Maryland, USA

10:00-10:25 Algebraic Problems in Error Correcting Codes Motivated by Distributed Storage Applications
Alexander Barg, University of Maryland, USA

10:30-10:55 Examples of Locally Recoverable Codes Arising from Galois Covers of Curves
Dani Hulzebos, University of Groningen, The Netherlands

11:00-11:25 Multi-cyclic Locally Repairable Code
Kenneth Chum, Chinese University of Hong Kong, Hong Kong

11:30-11:55 Locally Recoverable Codes with Multiple Recovery Sets: A General Fiber Product Construction
Beth Malmskog, Villanova University, USA

Wednesday, August 2

MS43
Real Algebraic Geometry and Optimization - Part II of III
10:00 AM-12:00 PM

Room:Skiles Building - 249

For Part 1 see MS32
For Part 3 see MS54

The minisymposium presents recent developments in the interplay of real algebraic geometry and optimization. Topics include positive polynomials, sums of squares, sums of non-negative circuits, semidefinite and geometric programming, polynomial optimization, signomial optimization, growth of polynomial functions, symmetries, and spectrahedra.

Organizer: Thorsten Theobald
Goethe Universität Frankfurt, Germany

Organizer: Timo de Wolff
Texas A&M University, USA

10:00-10:25 Factorizations of PSD Matrix Polynomials and their Smith Normal Forms
Christoph Hanselka, University of Auckland, New Zealand; Rainer Sinn, Georgia Institute of Technology, USA

10:30-10:55 Relative Entropy Relaxations for Signomial Optimization
Venkat Chandrasekaran, California Institute of Technology, USA; Parikshit Shah, Yahoo! Research, USA

11:00-11:25 Infeasible Subsystems of Spectrahedral Systems
Kai Kellner, Goethe Universität Frankfurt, Germany; Marc Pfetsch, Technische Universität Darmstadt, Germany; *Thorsten Theobald*, Goethe Universität Frankfurt, Germany

11:30-11:55 Reciprocal Linear Spaces
Mario Kummer, Universität Leipzig, Germany; Cynthia Vinzant, North Carolina State University, USA

Wednesday, August 2

MS44

Algorithms and Implementation in Numerical Algebraic Geometry - Part II of II

10:00 AM-12:00 PM

Room:Skiles Building - 255

For Part 1 see MS33

The foundation of algebraic geometry is the problem of solving systems of polynomial equations. Numerical methods can be used to perform algebraic geometric computations forming the field of numerical algebraic geometry which continues to advance rapidly. The continuing progress in computer hardware and software has enabled new algorithms and implementations. Examples include irreducible decompositions in multi-projective spaces, and numerical techniques for computing discrete objects such as polytopes. This session will feature recent progress in algorithms and implementations of theoretical advances in numerical algebraic geometry.

Organizer: Tianran Chen
Auburn University Montgomery, USA

10:00-10:25 Numerical Challenges to Successful Decomposition of Real Algebraic Surfaces

Dani Brake, University of Notre Dame, USA

10:30-10:55 A Dynamic Enumeration Approach for Computing Tropical Prevarieties

Anders Jensen, Aarhus University, Denmark; J*eff Sommars* and Jan Verschelde, University of Ilinois at Chicago, USA

11:00-11:25 Homotopies for Overdetermined Systems with Applications in Computer Vision

Margaret Regan and Jonathan Hauenstein, University of Notre Dame, USA; Sameer Agarwal, Google, Inc., USA

11:30-11:55 A Linear Homotopy Method for Finding Generalized Tensor Eigenpairs

Lixing Han, University of Michigan-Flint, USA

Wednesday, August 2

MS45

New Trends in Polynomial System Solving and Applications - Part III of III

10:00 AM-12:00 PM

Room:Skiles Building - 254

For Part 2 see MS14

Polynomial systems arise in numerous areas of mathematics and computer science, such as control theory, geometric modeling, biochemistry, coding theory and cryptology, to name a few. Efficient and reliable solvers for polynomial systems are in the epicentre of applied algebraic geometry and computer algebra. Available tools for recovering the solutions include Groebner bases, characteristic sets, multivariate resultants as well as symbolic-numeric methods and subdivision-based solvers. Among the challenges which occur in the process is reliable root isolation, certification and approximation, treatment of singular solutions, the exploitation of structure coming from specific applications as well as the development of reliable software. The minisymposium will host presentations related to state-of-the-art solution strategies for these problems, theoretical and algorithmic advances as well as emerging application areas.

Organizer: Angelos Mantzaflaris
RICAM, Austrian Academy of Sciences, Austria

Organizer: Elias Tsigaridas
INRIA Paris, France

10:00-10:25 Radical Varieties

David Sevilla, University of Extremadura, Spain

10:30-10:55 Detecting Projective Symmetries and Equivalences of Rational Curves by Solving Polynomial Systems of Equations

Michael Hauer and Bert Juettler, University of Linz, Austria

11:00-11:25 The Number of Embeddings of a Laman Graph

Matteo Gallet, RICAM, Austrian Academy of Sciences, Austria; Jose Capco, University of Linz, Austria; Georg Grasegger, Johann-Radon Institute (RICAM), Austria; Christoph Koutschan, RICAM, Austrian Academy of Sciences, Austria; Niels Lubbes, Johann-Radon Institute (RICAM), Austria; Josef Schicho, University of Linz, Austria

11:30-11:55 On the Connection Between Lexicographic Groebner Bases and Triangular Sets

Chenqi Mou, Beihang University, China

Wednesday, August 2

MS46

Decomposition and Identifiability of Real and Complex Tensors - Part II of II

10:00 AM-12:00 PM

Room:Skiles Building - 270

For Part 1 see MS25

Tensors and their decompositions have found application in a wide variety of applications such as algebraic statistics, chemometrics, machine learning and signal processing, among others. Many popular ways of sparsely representing tensors, such as the tensor rank, Waring, Chow, Hierarchical Tucker and Tensor Trains decompositions, naturally admit the structure of projective algebraic varieties over the complex field. Considering these decompositions over the reals, they become either real projective algebraic varieties or semi-algebraic sets. This minisymposium features talks on the properties of real and complex tensor decompositions and their interconnections

Organizer: Luca Chiantini
Università di Siena, Italy

Organizer: Giorgio Ottaviani
University of Firenze, Italy

Organizer: Nick Vannieuwenhoven
Katholieke Universiteit Leuven, Belgium

10:00-10:25 On Critical Rank-k Approximations to Tensors

Jan Draisma, University of Bern, Switzerland; Giorgio Ottaviani and Alicia Tocino Sánchez, University of Firenze, Italy

10:30-10:55 Hadamard Decompositions of Matrices

Alessandro Oneto, Inria Sophia Antipolis, France

11:00-11:25 Decomposing Tensors into Frames

Elina Robeva, Massachusetts Institute of Technology, USA

11:30-11:55 Monomials: Complex vs Real Rank and Waring Loci

Enrico Carlini, Politecnico di Torino, Italy

Wednesday, August 2

MS47

Biological Algebraic Statistics - Part II of III

10:00 AM-12:00 PM

Room:Skiles Building - 005

For Part 1 see MS36
For Part 3 see MS58

Algebraic statistics is a growing research area, and has recently been applied to several different problems from biology. One of the primary biological application areas is phylogenetics, the study of evolutionary histories of sets of organisms. The improvement of genetic sequencing technologies has led to a exponential increase in the amount of evolutionary data, requiring and allowing for new mathematical and statistics methods for its analysis. This minisymposium will bring together researchers who apply algebraic statistics techniques, interpreted very broadly, to a variety of biological problems.

Organizer: Megan Owen
Lehman College, CUNY, USA

Organizer: Ruriko Yoshida
Naval Postgraduate School, USA

10:00-10:25 Properties of Tree-valued Dimensionality Reduction

Gill Grindstaff and Thérèse Wu, The University of Texas at Austin, USA

10:30-10:55 Asymptotic Distributions of Sample Means on Piece-wise Linear Stratified Spaces

Chen Shen, Florida State University, USA

11:00-11:25 Tropical Fermat-Weber Points

Bo Lin, University of California, Berkeley, USA; Ruriko Yoshida, Naval Postgraduate School, USA

11:30-11:55 Tensors and Algebra Give Interpretable Groups for Crosstalk Mechanisms in Breast Cancer

Anna Seigal, University of California, Berkeley, USA; Mariano Beguerisse-Díaz, University of Oxford, United Kingdom; Birgit Schoeberl, Merrimack Pharmaceuticals, USA; Mario Niepel, Harvard Medical School, USA; Heather Harrington, University of Oxford, United Kingdom

Wednesday, August 2

MS48

Algebra and Combinatorics of Graphical Models - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 006

For Part 2 see MS59

A graphical model is a multivariate statistical model in which the nodes of the graph represent random variables and the (missing) edges encode conditional (in)dependence relations amongst these variables. Such statistical models have a wide variety of applications including various problems in biology and machine learning. The inherent combinatorial and algebraic structure of graphical models can be used to better understand important statistical problems such as model selection and identifiability. This minisymposium will focus on recent developments in the combinatorial and algebraic aspects of model selection and parameter identifiability for graphical models. Applications to causality, biology, and machine learning will be considered.

Organizer: Liam Solus
KTH Royal Institute of Technology, Sweden

10:00-10:25 Combinatorics of Bayesian Networks

Liam Solus, KTH Royal Institute of Technology, Sweden; Adityanarayanan Radhakrishnan, Massachusetts Institute of Technology, USA; Lenka Matejovicova, Institute of Science and Technology, Austria; Caroline Uhler and Yuhao Wang, Massachusetts Institute of Technology, USA

10:30-10:55 Latent Tree Models and the Em Algorithm

Hector D. Banos Cervantes, University of Alaska, USA

11:00-11:25 Parameter Identification in Directed Graphical Models

Mathias Drton, University of Washington, USA

11:30-11:55 Identifiability in Monomolecular Reaction Networks

Luis David Garcia Puente, Sam Houston State University, USA; Elizabeth Gross, San Jose State University, USA; Heather Harrington, University of Oxford, United Kingdom; Nicolette Meshkat, Santa Clara University, USA; Anne Shiu, Texas A&M University, USA

Wednesday, August 2

MS49

Multivariate Splines and Algebraic Geometry - Part I of III

10:00 AM-12:00 PM

Room:Skiles Building - 268

For Part 2 see MS60

The focus of the proposed minisymposium is on problems in approximation theory that may be studied using techniques from commutative algebra and algebraic geometry. Research interests of the participants relevant to the minisymposium fall broadly under multivariate spline theory, interpolation, and geometric modeling. For instance, a main problem of interest is to study the Hilbert function and algebraic structure of the spline module; recently there have been several advances on this front using notions from algebraic geometry. Nevertheless this problem remains elusive in low degree; the dimension of the space of piecewise cubics on a planar triangulation (especially relevant for applications) is still unknown in general!

Organizer: Michael DiPasquale
Oklahoma State University, USA

Organizer: Frank Sottile
Texas A&M University, USA

10:00-10:25 Algebraic Methods in Spline Theory

Michael DiPasquale, Oklahoma State University, USA

10:30-10:55 Semialgebraic Splines

Frank Sottile, Texas A&M University, USA; Sun Lanyin, Dalian University of Science and Technology, China; Michael Di Pasquale, Oklahoma State University, USA

11:00-11:25 Subdivision and Spline Spaces

Tatyana Sorokina, Towson University, USA; Hal Schenck, University of Illinois, USA

11:30-11:55 Geometric Realizations of the Space of Splines on a Simplicial Complex

Nelly Villamizar, Swansea University, United Kingdom

Wednesday, August 2

MS50

Algebraic Methods for Analyzing Biological Interaction Networks - Part I of IV

10:00 AM-12:00 PM

Room:Skiles Building - 271

For Part 2 see MS61

This minisymposium focuses on tools from algebraic geometry and beyond that can aid the study of biological interaction networks. Such systems frequently arise in systems biology and range from ODEs defined by biochemical reaction systems to models from ecology. Topics of interest range from conditions for permanence, persistence, and multiple equilibria to questions of parameter identifiability. The ODEs under study are often defined by polynomial or rational functions. Hence algebra and algebraic geometry are increasingly making important contributions, and this minisymposium will be a venue for exchanges on the latest developments in this area.

Organizer: Carsten Conradi
Hochschule Karlsruhe Technik und Wirtschaft, Germany

Organizer: Gheorghe Craciun
University of Wisconsin, Madison, USA

Organizer: Anne Shiu
Texas A&M University, USA

10:00-10:25 Algebraic Approaches to Biological Interaction Networks

Carsten Conradi, Hochschule Karlsruhe Technik und Wirtschaft, Germany

10:30-10:55 Reactant Subspaces and Positive Equilibria of Power Law Kinetic Systems

Dylan Antonio Talabis, University of the Philippines Los Baños, Philippines; Carlene Arceo, University of the Philippines Diliman, Philippines; Editha Jose, University of the Philippines Los Baños, Philippines; *Angelyn R. Lao*, De La Salle University, Philippines; Eduardo Mendoza, Ludwig-Maximilians-Universität München, Germany

continued in next column

11:00-11:25 Robust Permanence of Polynomial Dynamical Systems

James Brunner and Gheorghe Craciun, University of Wisconsin, Madison, USA

11:30-11:55 Joining and Decomposing Reaction Networks

Nicolette Meshkat, Santa Clara University, USA; Elizabeth Gross, San Jose State University, USA; Heather Harrington, University of Oxford, United Kingdom; Anne Shiu, Texas A&M University, USA

Wednesday, August 2

MS51

Symmetric Simplicial Complexes and Polytopes - Part II of III

10:00 AM-12:00 PM

Room:Skiles Building - 168

For Part 1 see MS40
For Part 3 see MS62

This session features talks related to group actions on cell complexes, convex bodies, etc. in discrete geometry, topological combinatorics, computational topology, and nearby areas. Sample topics include (but are not limited to) (i) symmetric simplicial complexes, which appear in topological combinatorics such as in the evasiveness conjecture or intersection problems of Tverberg-type (ii) Vietoris-Rips and Cech simplicial complexes arising from metric spaces with group actions (iii) symmetric polytopes and orbitopes, such as cyclic polytopes and Caratheodory orbitopes (iv) Dirichlet sterohedra (polyhedra which tile space under the action of a group of motions). Our goal would be to consolidate these topics that study simplicial complexes and convex bodies with group actions and employ combinatorial-geometric reasoning in the presence of symmetries. These are closely related and more connections have recently been established. For instance, symmetric polytopes recently appeared in the study of Cech complexes of the circle. Thus we feel that now would be the right time and SIAM AG17 would be the right venue to bring together the experts in the area to foster collaborations and provide an opportunity for participants to learn about the relevant methods employed by researchers working on related problems.

Organizer: Henry Adams
Colorado State University, USA

Organizer: Florian Frick
Cornell University, USA

10:00-10:25 Convex Geometry and Compactified Jacobians
Farbod Shokrieh, Cornell University, USA

10:30-10:55 Hyperplane Equipartitions Plus Constraints
Steven Simon, Bard College, USA

11:00-11:25 A Characterization of Simplicial Manifolds with $g_2 \leq 2$
Hailun Zheng, University of Washington, USA

11:30-11:55 Obstructions to Graph Homomorphisms
Anton Dochtermann, Texas State University, USA

Wednesday, August 2

MS52

Applied and Computational Topology - Part I of III

10:00 AM-12:00 PM

Room:Skiles Building - 170

For Part 2 see MS63

Applied and computational topology combines ideas from topology, geometry, statistics and computer science to address problems pertaining to the analysis of data. In the last decade, it has rapidly developed as a vibrant field of research attracting scientists across several communities. This minisymposium will provide a forum for discussion and dissemination of recent advances addressing computational challenges and foundational questions. In addition, applications to computational biology, dynamical systems and signal analysis will be presented.

Organizer: Jose Perea
Michigan State University, USA

Organizer: Justin Curry
University of Pennsylvania, USA

10:00-10:25 Induced Dynamics in the Space of Persistence Diagrams
Francis Motta, Duke University, USA

10:30-10:55 Cliques and Cavities in Neuroscience
Ann Sizemore and Chad Giusti, University of Pennsylvania, USA

11:00-11:25 Persistence-based Summaries for Metric Graphs
Ellen Gasparovic, Union College, USA

11:30-11:55 Persistence-based Summaries for Metric Graphs -- Revisited
Radmila Sazdanovic, North Carolina State University, USA

Lunch Break

12:00 PM-1:30 PM

Attendees on their own

Wednesday, August 2

SIAGA Editorial Board Meeting

12:00 PM-1:30 PM

Room: Skiles Building–006

IP6

Curves with Complex Multiplication and Applications to Cryptography

1:30 PM-2:30 PM

Room:Clough Undergraduate Learning Commons - 152

Chair: Anthony Varilly Alvarado, Rice University, USA

There are many advantages to using cryptosystems based on elliptic curves or genus 2 curves. However, implementation of these cryptosystems requires a curve over a finite field F where the number of F-rational points on the Jacobian is prime (or a prime times a small cofactor). I will explain how the problem of finding such curves leads to questions about reductions of curves with complex multiplication and conversely, how structural results about curves with complex multiplication affect algorithms for constructing cryptographically useful curves.

Bianca Viray

University of Washington, USA

Coffee Break

2:30 PM-3:00 PM

Room:Skiles Building

Wednesday, August 2

MS53

Algebraic Coding for Storage Applications - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 202

For Part 1 see MS42

Efficient coding of data for applications in distributed storage gives rise to new problems in coding theory. The main topic of the minisymposium is that of algebro-geometric methods in data coding that support efficient recovery of data stored on failed nodes in the system. Recently, codes on algebraic curves have been shown to enable local recovery of the data, and current research is focused on constructions and properties of locally recoverable codes from different families of curves and higher-dimensional varieties. We plan to cover these constructions in several talks of the symposium. Recent research in coding for storage also includes algebraic constructions of codes that perform local recovery based on a small part of a codeword (regenerating codes), as well as locality properties of known families of algebraic codes, starting with the classic Reed-Solomon codes. The symposium will include talks on local repair of this and other related families such as codes on Hermitian curves.

Organizer: Anthony Varilly Alvarado
Rice University, USA

Organizer: Alexander Barg
University of Maryland, USA

3:00-3:25 Evaluation Codes from Algebraic Surfaces over a Finite Field
John B. Little, College of the Holy Cross, USA

3:30-3:55 Optimal Locally Recoverable Codes from Algebraic Surfaces
Anthony Varilly Alvarado, Rice University, USA

4:00-4:25 Hierarchical Locally Recoverable Codes on Algebraic Curves
Sean F. Ballentine, University of Maryland, USA

4:30-4:55 Recent Results on Codes for Distributed Storage
Vijay Kumar, Indian Institute of Science, Bangalore, India

Wednesday, August 2

MS54

Real Algebraic Geometry and Optimization - Part III of III

3:00 PM-5:00 PM

Room:Skiles Building - 249

For Part 2 see MS43

The minisymposium presents recent developments in the interplay of real algebraic geometry and optimization. Topics include positive polynomials, sums of squares, sums of non-negative circuits, semidefinite and geometric programming, polynomial optimization, signomial optimization, growth of polynomial functions, symmetries, and spectrahedra.

Organizer: Thorsten Theobald
Goethe Universität Frankfurt, Germany

Organizer: Timo de Wolff
Texas A&M University, USA

3:00-3:25 Complexity in Polynomial Optimization with Integer Variables
Robert Hildebrand, IBM T.J. Watson Research Center, USA

3:30-3:55 Gram Spectrahedra
Lynn Chua, University of California, Berkeley, USA; Daniel Plaumann, Technische Universität Dortmund, Germany; Rainer Sinn, Georgia Institute of Technology, USA; Cynthia Vinzant, North Carolina State University, USA

4:00-4:25 Constrained Optimization via SONC Polynomials
Mareike Dressler, Goethe Universität Frankfurt, Germany

4:30-4:55 Deriving Convex Hull Forms of Special Symmetric Multilinear Polynomials
Yibo Xu, Warren Adams, and Akshay Gupte, Clemson University, USA

Wednesday, August 2

MS55

Applications of Numerical Algebraic Geometry in Math, Science, and Engineering - Part I of II

3:00 PM-5:00 PM

Room:Skiles Building - 255

For Part 2 see MS66

Numerical algebraic geometry is driven by applications. The need to solve polynomial systems is strong, especially in fields such as smart grid networks, chemical reaction networks, kinematics and robotics, quantum and string theory, algebraic statistics, and many others. With continuing advances in computer hardware and theory and algorithms in numerical algebraic geometry, the scope of problems we can solve will also evolve. This session features talks discussing the application of theory, algorithms, and software in numerical algebraic geometry to problems across mathematics, science, and engineering.

Organizer: Dani Brake
University of Notre Dame, USA

3:00-3:25 Model Selection for Gaussian Mixtures with Numerical Algebraic Geometry

Adel Alaeddini, University of Texas, San Antonio, USA; *Elizabeth Gross*, San Jose State University, USA; Sara Shirinkam, University of Texas, San Antonio, USA

3:30-3:55 Certification via Liaison Pruning

Nickolas Hein, Benedictine College, USA

4:00-4:25 Computational Algebraic Geometry Methods in Machine Learning

Dhagash Mehta, United Technologies Research Center, USA

4:30-4:55 Reduced Basis Homotopy Method for Computing Multiple Solutions of Nonlinear PDEs

Wenrui Hao, Pennsylvania State University, USA

Wednesday, August 2

MS56

Polyhedral and Combinatorial Biology - Part IV of IV

3:00 PM-5:00 PM

Room:Skiles Building - 254

For Part 3 see MS26

We explore the role that combinatorial and polyhedral structures play in understanding biological phenomenon. The rapid grown in technology, means that the sophistication of the algorithms used to analyze discrete biological data lags behind the availability of data. Discrete mathematicians are encouraged to attend this session, to learn about applications of their tools to biology. Biologists are encourage to attend to ensure that mathematicians are focused on problems that remain relevant in the rapidly developing biological landscape. Mathematical objects such as convex polyhedral, cell complexes, trees and networks can be used to understand a wide range of biological phenomena. This session will feature exploration of RNA secondary structures, neural codes, genome rearrangements as well as bacterial, gene, and species evolution. These applications show demonstrate how topics traditionally confined to the pure mathematical cannon help explore living organisms. In addition, this session will examine how biology generates novel mathematical questions and objects, such as the structure of varieties associated to Markov models of evolution, or the enumeration of gene trees under the coalescent model.

Organizer: Joseph P. Rusinko
Hobart and William Smith Colleges, USA

3:00-3:25 Valid Plane Trees and RNA

Elizabeth Drellich, Swarthmore College, USA; Julianna Tymoczko and Francis Black, Smith College, USA

3:30-3:55 Reconstructing Complex Cellular Mixtures from Heterogeneous Tissue Samples

Russell Schwartz, Carnegie Mellon University, USA

4:00-4:25 An Algebraic Approach to Categorical Data Fusion for Population Size Estimation

Ann Johnston, Pennsylvania State University, USA; Sonja Petrovic, Illinois Institute of Technology, USA; Aleksandra Slavkovic, Pennsylvania State University, USA

4:30-4:55 A Convex Realization of Neural Codes on Grids

Robert L. Williams, Texas A&M University, USA

Wednesday, August 2
MS57
Tensors: from Algebra to Applications - Part II of IV
3:00 PM-4:30 PM

Room:Skiles Building - 270

For Part 1 see MS35
For Part 3 see MS68

Tensors are a rapidly growing area of research in mathematics. Their theoretical study involves algebraic and geometric tools, and they are closely linked to applications in data science, statistics and more. This minisymposium gathers researchers who use algebraic methods to study tensors, and connect this insight to applications. We will hear talks on the spectral theory of tensors, a range of tensor decomposition and representation, computational studies of tensors, as well as connections to biological data analysis and machine learning.

Organizer: Elina Robeva
Massachusetts Institute of Technology, USA

Organizer: Anna Seigal
University of California, Berkeley, USA

3:00-3:25 Symmetric Tensor Nuclear Norms

Jiawang Nie, University of California, San Diego, USA

3:30-3:55 The Condition Number of Join Decompositions

Paul Breiding, Technische Universität Berlin, Germany; *Nick Vannieuwenhoven*, Katholieke Universiteit Leuven, Belgium

4:00-4:25 Connectedness of Tensor Ranks

Lek-Heng Lim, Ke Ye, and Yang Qi, University of Chicago, USA; Pierre Comon, Gipsa-Lab, France

Wednesday, August 2
MS58
Biological Algebraic Statistics - Part III of III
3:00 PM-5:00 PM

Room:Skiles Building - 005

For Part 2 see MS47

Algebraic statistics is a growing research area, and has recently been applied to several different problems from biology. One of the primary biological application areas is phylogenetics, the study of evolutionary histories of sets of organisms. The improvement of genetic sequencing technologies has led to a exponential increase in the amount of evolutionary data, requiring and allowing for new mathematical and statistics methods for its analysis. This minisymposium will bring together researchers who apply algebraic statistics techniques, interpreted very broadly, to a variety of biological problems.

Organizer: Megan Owen
Lehman College, CUNY, USA

Organizer: Ruriko Yoshida
Naval Postgraduate School, USA

3:00-3:25 An Invariants-Based Method for Efficient Identification of Hybrid Species under the Coalescent Model

Julia Chifman, American University, USA

3:30-3:55 Finite Phylogenetic Complexity and Combinatorics of Tables

Emanuele Ventura, Aalto University, Finland

4:00-4:25 Bounds on the Expected Size of the Maximum Agreement Subtree

Seth Sullivant, North Carolina State University, USA

4:30-4:55 Stochastic Safety Radius on NJ and BME Methods for Small Trees

Jing Xi, University of Wisconsin, Stout, USA; Jin Xie, University of Kentucky, USA; Ruriko Yoshida, Naval Postgraduate School, USA; Stefan Forcey, University of Akron, USA

Wednesday, August 2
MS59
Algebra and Combinatorics of Graphical Models - Part II of II
3:00 PM-5:00 PM

Room:Skiles Building - 006

For Part 1 see MS48

A graphical model is a multivariate statistical model in which the nodes of the graph represent random variables and the (missing) edges encode conditional (in)dependence relations amongst these variables. Such statistical models have a wide variety of applications including various problems in biology and machine learning. The inherent combinatorial and algebraic structure of graphical models can be used to better understand important statistical problems such as model selection and identifiability. This minisymposium will focus on recent developments in the combinatorial and algebraic aspects of model selection and parameter identifiability for graphical models. Applications to causality, biology, and machine learning will be considered.

Organizer: Liam Solus
KTH Royal Institute of Technology, Sweden

3:00-3:25 Totally Positive Graphical Models

Caroline Uhler, Massachusetts Institute of Technology, USA; Piotr Zwiernik, University of California, Berkeley, USA; Steffen Lauritzen, University of Copenhagen, Denmark

3:30-3:55 Computing the ML Degree of Hierarchical Log-linear Models

Serkan Hosten, San Francisco State University, USA

4:00-4:25 Matrix Schubert Varieties and Gaussian Conditional Independence Models

Alex Fink, Queen Mary, University of London, United Kingdom; *Jenna Rajchgot*, University of Saskatchewan, Canada; Seth Sullivant, North Carolina State University, USA

4:30-4:55 Bayesian Networks and Generalized Permutohedra

Fatemeh Mohammadi, Technische Universität Berlin, Germany; Caroline Uhler, Massachusetts Institute of Technology, USA; Charles Wang and *Josephine Yu*, Georgia Institute of Technology, USA

Wednesday, August 2

MS60

Multivariate Splines and Algebraic Geometry - Part II of III

3:00 PM-4:30 PM

Room:Skiles Building - 268

For Part 1 see MS49
For Part 3 see MS71

The focus of the proposed minisymposium is on problems in approximation theory that may be studied using techniques from commutative algebra and algebraic geometry. Research interests of the participants relevant to the minisymposium fall broadly under multivariate spline theory, interpolation, and geometric modeling. For instance, a main problem of interest is to study the Hilbert function and algebraic structure of the spline module; recently there have been several advances on this front using notions from algebraic geometry. Nevertheless this problem remains elusive in low degree; the dimension of the space of piecewise cubics on a planar triangulation (especially relevant for applications) is still unknown in general!

Organizer: Michael DiPasquale
Oklahoma State University, USA

Organizer: Frank Sottile
Texas A&M University, USA

3:00-3:25 Smooth Splines on Surfaces with General Topology
Bernard Mourrain, Inria Sophia Antipolis, France

3:30-3:55 Spaces of Splines, Vector Bundles, and Reflexive Sheaves
Peter F. Stiller, Texas A&M University, USA

4:00-4:25 Splines on Lattices and Equivariant Cohomology of Certain Affine Springer Fibers
Julianna Tymoczko, Smith College, USA

Wednesday, August 2

MS61

Algebraic Methods for Analyzing Biological Interaction Networks - Part II of IV

3:00 PM-5:00 PM

Room:Skiles Building - 271

For Part 1 see MS50
For Part 3 see MS72

This minisymposium focuses on tools from algebraic geometry and beyond that can aid the study of biological interaction networks. Such systems frequently arise in systems biology and range from ODEs defined by biochemical reaction systems to models from ecology. Topics of interest range from conditions for permanence, persistence, and multiple equilibria to questions of parameter identifiability. The ODEs under study are often defined by polynomial or rational functions. Hence algebra and algebraic geometry are increasingly making important contributions, and this minisymposium will be a venue for exchanges on the latest developments in this area.

Organizer: Carsten Conradi
Hochschule Karlsruhe Technik und Wirtschaft, Germany

Organizer: Gheorghe Craciun
University of Wisconsin, Madison, USA

Organizer: Anne Shiu
Texas A&M University, USA

3:00-3:25 Identifying Parameter Regions for Multistationarity
Carsten Wiuf and Elisenda Feliu, University of Copenhagen, Denmark; Carsten Conradi, Hochschule Karlsruhe Technik und Wirtschaft, Germany; Maya Mincheva, Northern Illinois University, USA

3:30-3:55 Regions of Multistationarity in Chemical Reaction Networks
Alicia Dickenstein, Universidad de Buenos Aires, Argentina; Frédéric Bihan, University of Savoy, France; Magalí Giaroli, Universidad de Buenos Aires, Argentina

4:00-4:25 Graphical Equilibria for Deterministic and Stochastic Reaction Networks
Daniele Cappelletti, University of Wisconsin, Madison, USA

4:30-4:55 Towards Quasi-stationary Distributions for a Class of Reaction Networks
Mads C. Hansen, University of Copenhagen, Denmark

Wednesday, August 2

MS62

Symmetric Simplicial Complexes and Polytopes - Part III of III

3:00 PM-4:30 PM

Room:Skiles Building - 168

For Part 2 see MS51

This session features talks related to group actions on cell complexes, convex bodies, etc. in discrete geometry, topological combinatorics, computational topology, and nearby areas. Sample topics include (but are not limited to) (i) symmetric simplicial complexes, which appear in topological combinatorics such as in the evasiveness conjecture or intersection problems of Tverberg-type (ii) Vietoris-Rips and Cech simplicial complexes arising from metric spaces with group actions (iii) symmetric polytopes and orbitopes, such as cyclic polytopes and Caratheodory orbitopes (iv) Dirichlet sterohedra (polyhedra which tile space under the action of a group of motions). Our goal would be to consolidate these topics that study simplicial complexes and convex bodies with group actions and employ combinatorial-geometric reasoning in the presence of symmetries. These are closely related and more connections have recently been established. For instance, symmetric polytopes recently appeared in the study of Cech complexes of the circle. Thus we feel that now would be the right time and SIAM AG17 would be the right venue to bring together the experts in the area to foster collaborations and provide an opportunity for participants to learn about the relevant methods employed by researchers working on related problems.

Organizer: Henry Adams
Colorado State University, USA

Organizer: Florian Frick
Cornell University, USA

3:00-3:25 Chromatic Numbers of Simplicial Manifolds

Frank H. Lutz, Technische Universität Berlin, Germany

3:30-3:55 Non-acyclicity of Coset Lattices and Generation of Finite Groups

Russ Woodroofe, Mississippi State University, USA

4:00-4:25 Some Relatives of Matroid Polytopes

Jose Samper, University of Miami, USA

Wednesday, August 2

MS63

Applied and Computational Topology - Part II of III

3:00 PM-5:00 PM

Room:Skiles Building - 170

For Part 1 see MS52
For Part 3 see MS74

Applied and computational topology combines ideas from topology, geometry, statistics and computer science to address problems pertaining to the analysis of data. In the last decade, it has rapidly developed as a vibrant field of research attracting scientists across several communities. This minisymposium will provide a forum for discussion and dissemination of recent advances addressing computational challenges and foundational questions. In addition, applications to computational biology, dynamical systems and signal analysis will be presented.

Organizer: Jose Perea
Michigan State University, USA

Organizer: Justin Curry
University of Pennsylvania, USA

3:00-3:25 Gromov-Hausdorff Limit of Wasserstein Spaces on Point Clouds

Nicolas Garcia Trillos, Brown University, USA

3:30-3:55 Topological Deep Learning of Biomolecular Data

Guowei Wei, Michigan State University, USA

4:00-4:25 Sheaves and Numerical Analysis

Michael Robinson, American University, USA

4:30-4:55 Topological Rhythm Hierarchy Quantification in Musical Audio

Chris Tralie, Duke University, USA

Wednesday, August 2

CP3

Algebra
3:00 PM-5:00 PM

Room:Skiles Building - 171

Chair: Jan Draisma, University of Bern, Switzerland

3:00-3:25 A Polynomial-time Algorithm to Compute Generalized Hermite Normal Forms of Matrices over Z(x)

Xiaoshan Gao, Chinese Academy of Sciences, China

3:30-3:55 Noetherianity for Cubic Polynomials

Rob H. Eggermont, Harm Derksen, and Andrew Snowden, University of Michigan, USA

4:00-4:25 Minimal Free Resolution of the Associated Graded Ring of Certain Affine Monomial Curves

Pinar Mete, Balikesir University, Turkey

4:30-4:55 Generalized Weierstrass Semigroups and their Poincaré Series

Wanderson Tenório, University of Campinas, Brazil

Intermission
5:00 PM-5:15 PM

Wednesday, August 2

SP1

SIAG/AG Early Career Prize Lecture: A Brief History of Smale's 17th Problem
5:15 PM-6:00 PM

Room:Clough Undergraduate Learning Commons - 152

Chair: Jan Draisma, Universitaet Bern, Switzerland

Chair: Agnes Szanto, North Carolina State University, USA

In the 80s, Steve Smale, soon joined by Mike Shub, studied from a theoretical point of view the complexity of numerically solving polynomial systems. They produced many new ideas to realize Newton's method algorithmic potential but they also left several open questions, one of which is Smale's 17th problem. From the early results to the final touch, I will sketch some of the ideas that leads to a solution to Smale's 17th problem.

Pierre Lairez

Inria Saclay Ile-de-France, France

Thursday, August 3

Registration
7:30 AM-4:00 PM

Room:Skiles Building - Bottom (0-th) Floor

Remarks
8:20 AM-8:30 AM

Room:Clough Undergraduate Learning Commons - 152

IP7

Gaussian Graphical Models from an Algebraic, Geometric and Combinatorial Perspective
8:30 AM-9:30 AM

Room:Clough Undergraduate Learning Commons - 152

Chair: Ruriko Yoshida, Naval Postgraduate School, USA

In this talk we will introduce probabilistic Gaussian graphical models as an interesting study object for applied algebraic geometers. In particular, we discuss maximum likelihood estimation for Gaussian graphical models, which leads to the problem of maximizing the determinant function over a spectrahedron, and to the positive definite matrix completion problem. Missing edges in a Gaussian graphical model correspond to conditional independence relations. We present a representation of conditional independence relations by a generalized permutohedron. Finally, we discuss extensions of Gaussian graphical models to exponential families leading to the concept of exponential varieties.

Caroline Uhler

Massachusetts Institute of Technology, USA

Coffee Break
9:30 AM-10:00 AM

Room:Skiles Building

Thursday, August 3

MS64

Coding Theory - Part I of IV

10:00 AM-11:30 AM

Room:Skiles Building - 249

For Part 2 see MS75

Coding Theory comes as an answer to the problem of reliable communication over noisy channels. As a research field, Coding Theory intersects Mathematics, Information Theory, and Electrical Engineering. The minisymposium session we propose focuses on the algebraic aspect of the theory of error-correcting codes, both in the context of Classical Coding Theory and Network Coding, a new emerging research field that studies network transmissions. Algebra plays a crucial role in Coding Theory, as it provides the main tools for the construction of error-correcting codes and their analysis.

Organizer: Alberto Ravagnani
University of Toronto, Canada

Organizer: Gretchen L. Matthews
Clemson University, USA

10:00-10:25 Distributed Coding for Evolving Content in Evolving Networks

Muriel Medard, N Prakash, and Vitaly Abdrashitov, Massachusetts Institute of Technology, USA

10:30-10:55 AG Codes as Products of Reed-Solomon Codes and Applications

Gretchen L. Matthews, Clemson University, USA

11:00-11:25 Locally Decodable Codes and Practical Applications

Daniel Augot, Inria, France

Thursday, August 3

MS65

Semidefinite Optimization and Convex Algebraic Geometry - Part I of IV

10:00 AM-12:00 PM

Room:Skiles Building - 202

For Part 2 see MS76

In the past decade there has been a surge of interest in algebraic approaches to optimization problems defined in terms of multivariate polynomials. Fundamental mathematical challenges that arise in this program include understanding the structure of nonnegative polynomials, the interplay between efficiency and complexity of different representations of algebraic sets, and the development of effective algorithms. Convexity provides a new viewpoint and a powerful framework for addressing these questions. This naturally brings us to the intersection of algebraic geometry, optimization,and convex geometry, with an emphasis on algorithms and computation. This emerging area has become known as *convex algebraic geometry*. We propose to have 4 minisymposium session to address the full breadth of problems arising in convex algebraic geometry, semidefinite programming and polynomial optimization.

Organizer: Greg Blekherman
Georgia Institute of Technology, USA

Organizer: Cynthia Vinzant
North Carolina State University, USA

Organizer: Daniel Plaumann
Technische Universität Dortmund, Germany

Organizer: Joao Gouveia
Universidade de Coimbra, Portugal

10:00-10:25 On Representing the Positive Semidefinite Cone using the Second-order Cone

Hamza Fawzi, University of Cambridge, United Kingdom

10:30-10:55 Bad Semidefinite Programs: They All Look the Same

Gabor Pataki, University of North Carolina at Chapel Hill, USA

11:00-11:25 Do Sums-of-squares Dream of Free Resolutions?

Greg Blekherman and Rainer Sinn, Georgia Institute of Technology, USA; *Mauricio Velasco*, Universidad de los Andes, Colombia

11:30-11:55 Hermitian Factorizations of Univariate Matrix Polynomials

Rainer Sinn and Greg Blekherman, Georgia Institute of Technology, USA; Christoph Hanselka, University of Auckland, New Zealand; Daniel Plaumann, Technische Universität Dortmund, Germany; Cynthia Vinzant, North Carolina State University, USA

Thursday, August 3

MS66

Applications of Numerical Algebraic Geometry in Math, Science, and Engineering - Part II of II

10:00 AM-12:00 PM

Room:Skiles Building - 255

For Part 1 see MS55

Numerical algebraic geometry is driven by applications. The need to solve polynomial systems is strong, especially in fields such as smart grid networks, chemical reaction networks, kinematics and robotics, quantum and string theory, algebraic statistics, and many others. With continuing advances in computer hardware and theory and algorithms in numerical algebraic geometry, the scope of problems we can solve will also evolve. This session features talks discussing the application of theory, algorithms, and software in numerical algebraic geometry to problems across mathematics, science, and engineering.

Organizer: Dani Brake
University of Notre Dame, USA

10:00-10:25 Exceptional Stewart-Gough Platforms and Segre Embeddings

Samantha Sherman and Jon Hauenstein, University of Notre Dame, USA; Charles Wampler, General Motors Research Laboratories, USA

10:30-10:55 Computing the Canonical Decomposition of Unbalanced Tensors by Homotopy Method

Tsung-Lin Lee, National Sun Yat-Sen University, Taiwan

11:00-11:25 Numerical Algebraic Geometry for Geolocation of RF Emitters

Karleigh Cameron, Colorado State University, USA

11:30-11:55 Topological Data Analysis for Real Algebraic Varieties

Parker Edwards, University of Florida, USA; Emilie Dufresne, University of Nottingham, United Kingdom; Heather Harrington, University of Oxford, United Kingdom; Jonathan Hauenstein, University of Notre Dame, USA

Thursday, August 3

MS67

Core Algorithms in Algebra and Geometry - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 254

For Part 2 see MS78

Experimentation with computer algebra systems is an important technique throughout algebra and geometry. In this minisymposium the speakers present both improvements to core algorithms that drive this experimentation, as well as research that has profited from such experiments. The minisymposium aims to be inclusive and represent the diversity of computer algebra systems.

Organizer: Thomas Kahle
Universität Magdeburg, Germany

10:00-10:25 When is a Polynomial Ideal Binomial After Changing Coordinates?

Lukas Katthän, Goethe Universität Frankfurt, Germany

10:30-10:55 Computing Chow Forms, Hurwitz Forms, and Beyond

Kathlén Kohn, Technische Universität Berlin, Germany

11:00-11:25 Computing GIT-fans with Symmetry

Janko Boehm, Technische Universität Kaiserslautern, Germany

11:30-11:55 The Computation of Discriminants in Mass-action Networks

Alexandru Iosif, Universität Magdeburg, Germany

Thursday, August 3

MS68

Tensors: from Algebra to Applications - Part III of IV

10:00 AM-11:30 AM

Room:Skiles Building - 270

For Part 2 see MS57
For Part 4 see MS79

Tensors are a rapidly growing area of research in mathematics. Their theoretical study involves algebraic and geometric tools, and they are closely linked to applications in data science, statistics and more. This minisymposium gathers researchers who use algebraic methods to study tensors, and connect this insight to applications. We will hear talks on the spectral theory of tensors, a range of tensor decomposition and representation, computational studies of tensors, as well as connections to biological data analysis and machine learning.

Organizer: Elina Robeva
Massachusetts Institute of Technology, USA

Organizer: Anna Seigal
University of California, Berkeley, USA

10:00-10:25 Adaptive Sparsity in Machine Learning and Autonomy

Sara Jamshidi, Pennsylvania State University, USA

10:30-10:55 Tensor Decomposition for Learning Latent Variable Models: Algorithms and Challenges

Rong Ge, Duke University, USA

11:00-11:25 On Learning Low Rank Tensors

Massimiliano Pontil, University College London, United Kingdom

Thursday, August 3
MS69
Algebraic and Topological Biology - Part I of IV
10:00 AM-12:00 PM

Room:Skiles Building - 005

For Part 2 see MS80

Recently there has been an explosion in the use of algebraic tools for modeling biological systems as well as topological data analysis methods for information retrieval from biological and medical data sets. Work in this area relies on the application of algebraic geometry to fully understand the algebraic structures and topological spaces in question and develop robust algorithms for data mining. The topics represented in the list of proposed titles are highly representative of cutting-edge research in this area. Speakers will discuss the use of algebra, topology and geometry to study chromosomal and RNA structures and cell genomics, as well as the inference of phylogenetic tree structures from algebraic-geometric data encoding and the study of neural codes using ideals, their associated varieties, and modules. Aside from the organizer, our speakers include graduate students, postdoctoral researchers, and early-career tenure-track faculty at liberal arts institutions. Additionally, this session will include many non-U.S. speakers and speakers from a broad variety of departmental affiliations.

Organizer: Ruth E. Davidson
University of Illinois at Urbana-Champaign, USA

10:00-10:25 An Overview of Novel Applications of Algebraic and Topological Biology
Ruth E. Davidson, University of Illinois at Urbana-Champaign, USA

10:30-10:55 An Algebraic Framework for Determining Weighted Rearrangement Distance
Sangeeta Bhatia, University of Western Sydney, Australia

11:00-11:25 Inferring Rooted Species Trees from Unrooted Gene Trees
James H. Degnan and Ayed Alanzi, University of New Mexico, USA

11:30-11:55 Dimensional Reduction for Phylogenetic Tree Models
Jeremy Sumner, University of Tasmania, Australia

Thursday, August 3
MS70
Software and Computation in Algebraic Statistics - Part I of II
10:00 AM-12:00 PM

Room:Skiles Building - 006

For Part 2 see MS81

For over two decades, algebraic methods have expanded the horizons of statistics with both theoretical and applied contributions. In this session we'll consider recent advances in applied algebraic statistics, focusing on algorithms and implementations. Specific applications range from classical discrete multivariate analysis to social networks and phylogenetics.

Organizer: Elizabeth Gross
San Jose State University, USA

Organizer: David Kahle
Baylor University, USA

10:00-10:25 Algebraic Statistics in R – A State of the Union
David Kahle, Baylor University, USA

10:30-10:55 Using Macaulay2 from within R: The M2R Package
Christopher Oneill, University of California, Davis, USA; David Kahle, Baylor University, USA; Jeff Sommars, University of Ilinois at Chicago, USA

11:00-11:25 Semigroups -- A Computational Approach
Ruriko Yoshida, Naval Postgraduate School, USA; Florian Kohl, Freie Universität Berlin, Germany; Yanxi Li, University of Kentucky, USA; Johannes Rauh, Max Planck Institute for Mathematics in the Sciences, Germany

11:30-11:55 SEMID: An R Package for Parameter Identifiability in Linear Structural Equation Models
Luca Weihs, University of Washington, USA

Thursday, August 3
MS71
Multivariate Splines and Algebraic Geometry - Part III of III
10:00 AM-12:00 PM

Room:Skiles Building - 268

For Part 2 see MS60

The focus of the proposed minisymposium is on problems in approximation theory that may be studied using techniques from commutative algebra and algebraic geometry. Research interests of the participants relevant to the minisymposium fall broadly under multivariate spline theory, interpolation, and geometric modeling. For instance, a main problem of interest is to study the Hilbert function and algebraic structure of the spline module; recently there have been several advances on this front using notions from algebraic geometry.   Nevertheless this problem remains elusive in low degree; the dimension of the space of piecewise cubics on a planar triangulation (especially relevant for applications) is still unknown in general!

Organizer: Michael DiPasquale
Oklahoma State University, USA

Organizer: Frank Sottile
Texas A&M University, USA

10:00-10:25 Dimension of Tchebycheffian Spline Spaces on T-meshes
Cesare Bracco, University of Florence, Italy; Tom Lyche, University of Oslo, Norway; Carla Manni, Universita di Roma "Tor Vergata", Italy; Fabio Roman, University of Turin, Italy; Hendrik Speleers, Universita di Roma "Tor Vergata", Italy

10:30-10:55 Interpolating with Hyperplane Arrangements via Generalized Star Configurations Varieties
Stefan Tohaneanu, University of Idaho, USA

11:00-11:25 Algebraic Geometry and Interpolation Problems
Boris Shekhtman, University of South Florida, USA

11:30-11:55 Basis and Dimension of Trivariate Geometrically Continuous Isogeometric Functions on Two-Patch Domains
Katharina Birner and Bert Juettler, University of Linz, Austria; Angelos Mantzaflaris, RICAM, Austrian Academy of Sciences, Austria

Thursday, August 3

MS72

Algebraic Methods for Analyzing Biological Interaction Networks - Part III of IV

10:00 AM-12:00 PM

Room:Skiles Building - 271

For Part 2 see MS61
For Part 4 see MS83

This minisymposium focuses on tools from algebraic geometry and beyond that can aid the study of biological interaction networks. Such systems frequently arise in systems biology and range from ODEs defined by biochemical reaction systems to models from ecology. Topics of interest range from conditions for permanence, persistence, and multiple equilibria to questions of parameter identifiability. The ODEs under study are often defined by polynomial or rational functions. Hence algebra and algebraic geometry are increasingly making important contributions, and this minisymposium will be a venue for exchanges on the latest developments in this area.

Organizer: Carsten Conradi
Hochschule Karlsruhe Technik und Wirtschaft, Germany

Organizer: Gheorghe Craciun
University of Wisconsin, Madison, USA

Organizer: Anne Shiu
Texas A&M University, USA

10:00-10:25 Deficiency-based Approaches to Steady State Parametrizations: New and Old
Matthew D. Johnston, San Jose State University, USA

10:30-10:55 Parametrising the Steady State Variety by Linear Elimination
Meritxell Saez, Elisenda Feliu, and Carsten Wiuf, University of Copenhagen, Denmark

11:00-11:25 Intermediates, Enzymes, Binomiality and Multistationarity
Elisenda Feliu and *Amirhossein Sadeghi Manesh*, University of Copenhagen, Denmark

11:30-11:55 Polynomial Dynamical Systems Derived from Euclidean Embedded Graphs
Polly Yu, University of Wisconsin, Madison, USA

Thursday, August 3

MS73

Computational Tropical Geometry - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 168

For Part 2 see MS84

This session will highlight recent advances in tropical geometry, algebra, and combinatorics, focusing on computational aspects and applications. The area enjoys close interactions with max-plus algebra, polyhedral geometry, combinatorics, Groebner theory, and numerical algebraic geometry.

Organizer: Josephine Yu
Georgia Institute of Technology, USA

Organizer: Anders Jensen
Aarhus University, Denmark

10:00-10:25 Gonality Sequences of Complete Graphs and Complete Bipartite Graphs
Marta Panizzut, Technische Universität, Berlin, Germany

10:30-10:55 Computing Tropical Variaties using Triangular Decomposition
Yue Ren, Ben-Gurion University, Israel

11:00-11:25 The Tropical Nullstellensatz
Diane Maclagan, University of Warwick, United Kingdom

11:30-11:55 Tropical Hyperelliptic Curves in the Plane
Ralph Morrison, Williams College, USA

Thursday, August 3

MS74

Applied and Computational Topology - Part III of III

10:00 AM-12:00 PM

Room:Skiles Building - 170

For Part 2 see MS63

Applied and computational topology combines ideas from topology, geometry, statistics and computer science to address problems pertaining to the analysis of data. In the last decade, it has rapidly developed as a vibrant field of research attracting scientists across several communities. This minisymposium will provide a forum for discussion and dissemination of recent advances addressing computational challenges and foundational questions. In addition, applications to computational biology, dynamical systems and signal analysis will be presented.

Organizer: Jose Perea
Michigan State University, USA

Organizer: Justin Curry
University of Pennsylvania, USA

10:00-10:25 Local Cohomology and Stratification
Vidit Nanda, Oxford University, United Kingdom

10:30-10:55 The Topology of Biological Aggregations: Experiments and Simulations
Lori Ziegelmeier, Macalester College, USA

11:00-11:25 A Morse-theoretic Algorithm to Compute Persistent Homology, with Generators
Greg Henselman, Princeton University, USA

11:30-11:55 Interleavings on Categories with Lax $(0,\infty)$-Action
Anastasios Stefanou, State University of New York, Albany, USA

Thursday, August 3

CP4

Various Applications
10:00 AM-11:30 AM

Room:Skiles Building - 171

Chair: Agnes Szanto, North Carolina State University, USA

10:00-10:25 Difference Sets and Grassmannian Packings
Emily King, Universität Bremen, Germany

10:30-10:55 Resonance Set of a Real Polynomial and its Application
Alexander B. Batkhin, Keldysh Institute of Applied Mathematics of RAS, Russia and Moscow Institute of Physics and Technology, Russia

11:00-11:25 String Topological Robotics
My Ismail I. Mamouni, Cedar Rapids Medical Education Foundation, Rabat, Morocco

Lunch Break
12:00 PM-1:30 PM

Attendees on their own

Thursday, August 3

IP8

Open Problems in Finite Frame Theory
1:30 PM-2:30 PM

Room:Clough Undergraduate Learning Commons - 152

Chair: Giorgio Ottaviani, University of Firenze, Italy

Finite frame theory is the study of collections of vectors with certain application-driven properties. This talk will discuss a few instances of finite frame theory. Consider the problem of packing points in real or complex projective space so that the minimum distance is maximized. Such optimal line packings find applications in sparse decomposition and quantum information theory. Today, there are various bounds on the best packings, notably, Levenshtein's bound arising from linear programming. Ensembles which achieve equality in Levenshtein's bound are projective t-designs with small angle sets, and their existence is the subject of several open problems.

Dustin Mixon
Air Force Institute of Technology, USA

Coffee Break
2:30 PM-3:00 PM

Room:Skiles Building

Thursday, August 3

MS75

Coding Theory - Part II of IV
3:00 PM-5:00 PM

Room:Skiles Building - 249

For Part 1 see MS64
For Part 3 see MS86
Coding Theory comes as an answer to the problem of reliable communication over noisy channels. As a research field, Coding Theory intersects Mathematics, Information Theory, and Electrical Engineering. The minisymposium session we propose focuses on the algebraic aspect of the theory of error-correcting codes, both in the context of Classical Coding Theory and Network Coding, a new emerging research field that studies network transmissions. Algebra plays a crucial role in Coding Theory, as it provides the main tools for the construction of error-correcting codes and their analysis.

Organizer: Alberto Ravagnani
University of Toronto, Canada

Organizer: Gretchen L. Matthews
Clemson University, USA

3:00-3:25 Weight Two Masking in the McEliece Public Key System
Joachim Rosenthal, Universität Zürich, Switzerland; Violetta Weger, University of Zurich, Switzerland

3:30-3:55 Well-rounded Lattices and Applications to Physical Layer Security
Piermarco Milione, Aalto University, Finland

4:00-4:25 Rank-metric Codes of Zero Defect
Alberto Ravagnani, University of Toronto, Canada

4:30-4:55 Quantum Codes from AG Codes of Castle Type
Fernando Torres, University of Campinas, Brazil

Thursday, August 3

MS76

Semidefinite Optimization and Convex Algebraic Geometry - Part II of IV

3:00 PM-5:00 PM

Room:Skiles Building - 202

For Part 1 see MS65
For Part 3 see MS87

In the past decade there has been a surge of interest in algebraic approaches to optimization problems defined in terms of multivariate polynomials. Fundamental mathematical challenges that arise in this program include understanding the structure of nonnegative polynomials, the interplay between efficiency and complexity of different representations of algebraic sets, and the development of effective algorithms. Convexity provides a new viewpoint and a powerful framework for addressing these questions. This naturally brings us to the intersection of algebraic geometry, optimization,and convex geometry, with an emphasis on algorithms and computation. This emerging area has become known as convex algebraic geometry. We propose to have 4 minisymposium sessions to address the full breadth of problems arising in convex algebraic geometry, semidefinite programming and polynomial optimization.

Organizer: Greg Blekherman
Georgia Institute of Technology, USA

Organizer: Cynthia Vinzant
North Carolina State University, USA

Organizer: Daniel Plaumann
Technische Universität Dortmund, Germany

Organizer: Joao Gouveia
Universidade de Coimbra, Portugal

3:00-3:25 Polyhedral Approximations to Nonnegative Polynomials

Alperen Ergur, North Carolina State University, USA

3:30-3:55 Tropical Spectrahedra

Xavier Allamigeon and *Stephane Gaubert*, Inria and CMAP, Ecole Polytechnique, France; Mateusz Skomra, CMAP, Ecole Polytechnique, France

4:00-4:25 Polynomial Norms

Amir Ali Ahmadi, Princeton University, USA; Etienne Klerk, de, Tilburg University, The Netherlands; *Georgina Hall*, Princeton University, USA

4:30-4:55 Semidefinite Approximations of Reachable Sets for Discrete-time Polynomial Systems

Victor Magron, CNRS, France; Didier Henrion, LAAS-CNRS, Toulouse, France; Pierre-Loic Garoche, ONERA, France; Xavier Thirioux, École nationale supérieure d'électrotechnique, d'électronique, d'informatique, d'hydraulique et des télécommunications, France

Thursday, August 3

MS77

Theoretical Advances in Numerical Algebraic Geometry - Part I of III

3:00 PM-5:00 PM

Room:Skiles Building - 255

For Part 2 see MS88

Numerical Algebraic Geometry is the analysis and development of algorithms for computing with polynomial systems of equations. This minisymposium focuses on the main underlying foundational concepts, that include: the theory of real and complex varieties, root bounds for systems, certification criteria, dual spaces, and specialized objects such as witness sets and homotopy systems. This session focuses on advancements in the theory of numerical algebraic geometry, and how it informs the development of algorithms.

Organizer: Robert Krone
Queen's University, Canada

Organizer: Gregorio Malajovich
Universidade Federal do Rio De Janeiro, Brazil

3:00-3:25 Computing Newton Polytopes via Numerical Algebraic Geometry

Taylor Brysiewicz, Texas A&M University, USA

3:30-3:55 On Sparse Homotopy and Toric Varieties

Gregorio Malajovich, Universidade Federal do Rio De Janeiro, Brazil

4:00-4:25 On Isolation of Simple Multiple Zeros of Polynomial Systems

Nan Li, Tianjin University, China

4:30-4:55 Singular Value Homotopy for Finding Critical Parameters in Differential Equations

James B. Collins, West Texas A&M University, USA; Jon Hauenstein, University of Notre Dame, USA

Thursday, August 3

MS78

Core Algorithms in Algebra and Geometry - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 254

For Part 1 see MS67

Experimentation with computer algebra systems is an important technique throughout algebra and geometry. In this minisymposium the speakers present both improvements to core algorithms that drive this experimentation, as well as research that has profited from such experiments. The minisymposium aims to be inclusive and represent the diversity of computer algebra systems.

Organizer: Thomas Kahle
Universität Magdeburg, Germany

3:00-3:25 Homological Algebra in Macaulay2

Gregory G. Smith, Queen's University, Canada

3:30-3:55 A Combinatorial Smoothness Criterion for Spherical Varieties

Johannes Hofscheier, Universität Magdeburg, Germany

4:00-4:25 Injective Resolutions in Toric Geometry

Lars Kastner, Freie Universität Berlin, Germany

4:30-4:55 Asymptotic Syzygies via Numerical Linear Algebra and High Throughput Computing

Jay Yang, University of Wisconsin, Madison, USA

Thursday, August 3

MS79

Tensors: from Algebra to Applications - Part IV of IV

3:00 PM-4:30 PM

Room:Skiles Building - 270

For Part 3 see MS68

Tensors are a rapidly growing area of research in mathematics. Their theoretical study involves algebraic and geometric tools, and they are closely linked to applications in data science, statistics and more. This minisymposium gathers researchers who use algebraic methods to study tensors, and connect this insight to applications. We will hear talks on the spectral theory of tensors, a range of tensor decomposition and representation, computational studies of tensors, as well as connections to biological data analysis and machine learning.

Organizer: Elina Robeva
Massachusetts Institute of Technology, USA

Organizer: Anna Seigal
University of California, Berkeley, USA

3:00-3:25 The Geometry of Rank-one Tensor Completion

Thomas Kahle, Universität Magdeburg, Germany; *Kaie Kubjas*, Aalto University, Finland; Mario Kummer, Universität Leipzig, Germany; Zvi H. Rosen, University of Pennsylvania, USA

3:30-3:55 No Occurrence Obstructions in Geometric Complexity Theory

Peter Buergisser, Technische Universität Berlin, Germany

4:00-4:25 Border Ranks of Monomials

Luke Oeding, Auburn University, USA

Thursday, August 3

MS80

Algebraic and Topological Biology - Part II of IV

3:00 PM-5:00 PM

Room:Skiles Building - 005

For Part 1 see MS69
For Part 3 see MS91

Recently there has been an explosion in the use of algebraic tools for modeling biological systems as well as topological data analysis methods for information retrieval from biological and medical data sets. Work in this area relies on the application of algebraic geometry to fully understand the algebraic structures and topological spaces in question and develop robust algorithms for data mining. The topics represented in the list of proposed titles are highly representative of cutting-edge research in this area. Speakers will discuss the use of algebra, topology and geometry to study chromosomal and RNA structures and cell genomics, as well as the inference of phylogenetic tree structures from algebraic-geometric data encoding and the study of neural codes using ideals, their associated varieties, and modules. Aside from the organizer, our speakers include graduate students, postdoctoral researchers, and early-career tenure-track faculty at liberal arts institutions. Additionally, this session will include many non-U.S. speakers and speakers from a broad variety of departmental affiliations.

Organizer: Ruth E. Davidson
University of Illinois at Urbana-Champaign, USA

3:00-3:25 Genome Rearrangement Distance under Inversions and Deletions: A Semigroup Model

Andrew Francis, University of Western Sydney, Australia

Thursday, August 3

MS80

Algebraic and Topological Biology - Part II of IV

3:00 PM-5:00 PM

continued

3:30-3:55 Topological Methods for Cancer Genomics

Pablo Camara and Udi Rubin, Columbia University, USA; Arnold Levine, Institute for Advanced Studies, USA; Raul Rabadan, Columbia University, USA

4:00-4:25 Topological Features in Cancer Gene Expression Data

Svetlana Lookwood, Washington State University, USA; *Bala Krishnamoorthy*, Washington State University, Vancouver, USA

4:30-4:55 Mathematical Methods to Quantify the Topological Complexity of Chromosomes

Javier Asuaga, University of California, Davis, USA

Thursday, August 3

MS81

Software and Computation in Algebraic Statistics - Part II of II

3:00 PM-4:30 PM

Room:Skiles Building - 006

For Part 1 see MS70

For over two decades, algebraic methods have expanded the horizons of statistics with both theoretical and applied contributions. In this session we'll consider recent advances in applied algebraic statistics, focusing on algorithms and implementations. Specific applications range from classical discrete multivariate analysis to social networks and phylogenetics.

Organizer: Elizabeth Gross
San Jose State University, USA

Organizer: David Kahle
Baylor University, USA

3:00-3:25 Fast Exact Tests for Stochastic Block Models using Algebraic Statistics

Vishesh Karwa, Harvard University and Carnegie Mellon University, USA

3:30-3:55 Parameter Hypergraphs, Fiber Walks and Goodness-of-fit Testing for Biological Network Data

Despina Stasi, Illinois Institute of Technology, USA

4:00-4:25 Phylogenetic Trees, a M2 Package

Allen Stewart, Seattle University, USA; Hector Banos, University of Alaska, Fairbanks, USA; Nathaniel Bushek, University of Alaska, Anchorage, USA; Ruth E. Davidson, University of Illinois at Urbana-Champaign, USA; Elizabeth Gross, San Jose State University, USA; Pamela Harris, Williams College, USA; Robert Krone, Queen's University, Canada; Colby Long, Ohio State University, USA; Robert Walker, University of Michigan, USA

Thursday, August 3

MS82

Euclidean Distance Degree: Theory, Computation and Applications - Part I of II

3:00 PM-5:00 PM

Room:Skiles Building - 268

For Part 2 see MS93

Given a model (i.e. a subset of a real vector space) described by polynomial equations, the Euclidean distance (ED) problem is the optimization problem which seeks to find the nearest model point to a given data point with respect to the Euclidean norm. The number of complex critical points of the polynomial system associated to this problem is called the ED degree and is an invariant of the model. This minisymposium will explore various attributes of the ED problem, highlighting theoretical connections, computational approaches, and applications. Recent developments have illustrated the application of classical constructions and invariants from the intersection theory of projective algebraic varieties to the ED problem. These connections will be discussed, including recent results linking the ED degree of a variety to its conormal variety, polar degrees, and Chern-Mather class. There has also been recent progress in effective techniques to study and solve the ED problem in both particular cases (i.e. secant varieties and toric varieties) and in the general case. Several talks will focus on some of these developments and on related computational methods in real algebraic geometry such as methods to compute the critical points of maps specified by polynomials. ED problems have natural applications. Several of these will be discussed, including applications of the ED degree to computer vision and relations between the ED problem and semi-algebraic geometry.

Organizer: Martin Helmer
University of California, Berkeley, USA

Organizer: Corey Harris
Florida State University, USA

3:00-3:25 Polar Varieties and Euclidean Distance Degree

Ragni Piene, University of Oslo, Norway

3:30-3:55 Nearest Points on Toric Varieties

Martin Helmer, University of California, Berkeley, USA; Bernd Sturmfels, Max Planck Institute Leipzig, Germany and University of California, Berkeley, USA

4:00-4:25 The ED Degree of the Camera Variety

Daniel Lowengrub, University of California, Berkeley, USA

4:30-4:55 Local Euler Obstructions of Toric Varieties

Bernt-Ivar U. Nødland, University of Oslo, Norway

Thursday, August 3

MS83

Algebraic Methods for Analyzing Biological Interaction Networks - Part IV of IV

3:00 PM-5:00 PM

Room:Skiles Building - 271

For Part 3 see MS72

This minisymposium focuses on tools from algebraic geometry and beyond that can aid the study of biological interaction networks. Such systems frequently arise in systems biology and range from ODEs defined by biochemical reaction systems to models from ecology. Topics of interest range from conditions for permanence, persistence, and multiple equilibria to questions of parameter identifiability. The ODEs under study are often defined by polynomial or rational functions. Hence algebra and algebraic geometry are increasingly making important contributions, and this minisymposium will be a venue for exchanges on the latest developments in this area.

Organizer: Carsten Conradi
Hochschule Karlsruhe Technik und Wirtschaft, Germany

Organizer: Gheorghe Craciun
University of Wisconsin, Madison, USA

Organizer: Anne Shiu
Texas A&M University, USA

3:00-3:25 A Convergent and Efficient Algorithm for Calculating Equilibrium for Chemical Networks of Reversible Binding Reactions

Gilles Gnacadja, Amgen Inc., USA

3:30-3:55 Multistationarity in Interaction Networks

Badal Joshi, California State University, San Marcos, USA

4:00-4:25 Inheritance of Bistability in Mass Action Reaction Networks

Casian Pantea, West Virginia University, USA; Murad Banaji, Middlesex University, United Kingdom

4:30-4:55 Algebraic Complexity of Chemical Reaction Networks Through EDdegrees

Michael F. Adamer, University of Oxford, United Kingdom; Martin Helmer, University of California, Berkeley, USA

Thursday, August 3

MS84

Computational Tropical Geometry - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 168

For Part 1 see MS73

This session will highlight recent advances in tropical geometry, algebra, and combinatorics, focusing on computational aspects and applications. The area enjoys close interactions with max-plus algebra, polyhedral geometry, combinatorics, Groebner theory, and numerical algebraic geometry.

Organizer: Josephine Yu
Georgia Institute of Technology, USA

Organizer: Anders Jensen
Aarhus University, Denmark

3:00-3:25 Construction of Lindstrom Valuations of Algebraic Extensions

Dustin Cartwright, University of Tennessee, Knoxville, USA

3:30-3:55 A Tropical Approach to Bilevel Programming

Marianne Akian, Inria and CMAP, Ecole Polytechnique, France; Mustapha Bouhtou, Orange Labs, France; *Jean Bernard Eytard* and Stephane Gaubert, Inria and CMAP, Ecole Polytechnique, France

4:00-4:25 Abstract Tropical Linear Programming

Georg Loho, Technische Universität Berlin, Germany

4:30-4:55 Computing Tropical Linear Spaces

Benjamin Schröter, Technische Universität Berlin, Germany

Thursday, August 3

MS85

Resultants, Subresultants and Applications - Part I of III

3:00 PM-5:00 PM

Room:Skiles Building - 170

For Part 2 see MS96

The minisymposium focuses on recent advances on resultant, discriminant and subresultant theory, and their connections with (and applications in) interpolation problems, real root finding, geometric computation, Schur polynomials, polynomial optimization, etc.

Organizer: Teresa Krick
Universidad de Buenos Aires, Argentina

Organizer: Agnes Szanto
North Carolina State University, USA

3:00-3:25 Introductory Talk
Agnes Szanto, North Carolina State University, USA

3:30-3:55 Resultants Modulo P
Laurent Buse, Inria Sophia Antipolis, France; *Carlos D'Andrea* and Martin Sombra, Universitat de Barcelona, Spain

4:00-4:25 Offsets and Subresultants
Gema M. Diaz-Toca, Universidad de Murcia, Spain; Laureano Gonzalez-Vega and Mario Fioravanti, Universidad de Cantabria, Spain; Jorge Caravantes, Universidad Complutense de Madrid, Spain; Ioana Necula, Universidad de Sevilla, Spain; Juan Gerardo Alcázar, Universidad de Alcalá, Spain

4:30-4:55 Resultants and Subresultants through Evaluation: Formulae and Applications
Laureano Gonzalez-Vega, Universidad de Cantabria, Spain

Intermission
5:00 PM-5:15 PM

SIAG/AG Business Meeting
5:15 PM-6:15 PM

Room:Clough Undergraduate Learning Commons - 152

Friday, August 4

Registration
7:30 AM-4:00 PM

Room:Skiles Building - Bottom (0-th) Floor

Closing Remarks
8:20 AM-8:30 AM

Room:Clough Undergraduate Learning Commons - 152

Friday, August 4

IP9

Carathéodory Style Theorems for Discrete Optimization and Game Theory

8:30 AM-9:30 AM

Room:Clough Undergraduate Learning Commons - 152

Chair: Thorsten Theobald, Goethe Universität Frankfurt, Germany

Convex geometry has been an important pillar of the theory of optimization algorithms (e.g., think of Ellipsoid method) and my talk will show this continues to be the case today by focusing one influential theorem, Carathéodory's theorem from 1905. In its most basic form it describes the size of a minimal linear combination representing a vector in a cone and it is among the most fundamental results in Convex Geometry and it has seen many variations and extensions. I will review some variations of Carathéodory's theorem that have interesting applications in combinatorial optimization and game theory. E.g., given a system $Ax=b$, $x \geq 0$, what is the size of the sparsest solution integer? Integral versions of Carathéodory's theorem improve prior bounds and show some of the fascinating structure of sparse integer solutions of Diophantine equations. Another example will be the use of Hilbert bases in augmentation algorithms for optimization. I will mention some open problems too.

Jesús A. De Loera
University of California, Davis, USA

Coffee Break
9:30 AM-10:00 AM

Room:Skiles Building

Friday, August 4

MS86

Coding Theory - Part III of IV
10:00 AM-12:00 PM

Room:Skiles Building - 249

For Part 2 see MS75
For Part 4 see MS97
Coding Theory comes as an answer to the problem of reliable communication over noisy channels. As a research field, Coding Theory intersects Mathematics, Information Theory, and Electrical Engineering. The minisymposium session we propose focuses on the algebraic aspect of the theory of error-correcting codes, both in the context of Classical Coding Theory and Network Coding, a new emerging research field that studies network transmissions. Algebra plays a crucial role in Coding Theory, as it provides the main tools for the construction of error-correcting codes and their analysis.

Organizer: Alberto Ravagnani
University of Toronto, Canada

Organizer: Gretchen L. Matthews
Clemson University, USA

10:00-10:25 The Ingleton Ratio, the Inclusion-exclusion Ratio and the Entropy Region
John A. Mackenzie, University of Strathclyde, United Kingdom; *Michael E. O'Sullivan*, San Diego State University, USA; Sarah Roy, Unaffiliated

10:30-10:55 Communication Efficient and Strongly Secure Secret Sharing Schemes Based on Algebraic Geometry Codes
Umberto Martinez-Penas, Aalborg University, Denmark

11:00-11:25 Quasi-cyclic Subcodes of Cyclic Codes
Cem Güneri, Sabanci University, Turkey

11:30-11:55 Improved Constructions of Nested Code Pairs
Carlos Galindo, Universitat Jaume I, Spain; *Olav Geil*, Aalborg University, Denmark; Fernando Hernando, Universidad Jaume I, Spain; Diego Ruano, Aalborg University, Denmark

Friday, August 4

MS87

Semidefinite Optimization and Convex Algebraic Geometry - Part III of IV
10:00 AM-12:00 PM

Room:Skiles Building - 202

For Part 2 see MS76
For Part 4 see MS98
In the past decade there has been a surge of interest in algebraic approaches to optimization problems defined in terms of multivariate polynomials. Fundamental mathematical challenges that arise in this program include understanding the structure of nonnegative polynomials, the interplay between efficiency and complexity of different representations of algebraic sets, and the development of effective algorithms. Convexity provides a new viewpoint and a powerful framework for addressing these questions. This naturally brings us to the intersection of algebraic geometry, optimization,and convex geometry, with an emphasis on algorithms and computation. This emerging area has become known as *convex algebraic geometry*. We propose to have 4 minisymposium session to address the full breadth of problems arising in convex algebraic geometry, semidefinite programming and polynomial optimization.

Organizer: Greg Blekherman
Georgia Institute of Technology, USA

Organizer: Cynthia Vinzant
North Carolina State University, USA

Organizer: Daniel Plaumann
Technische Universität Dortmund, Germany

Organizer: Joao Gouveia
Universidade de Coimbra, Portugal

10:00-10:25 Algebraic Certificates of Disconnectedness
Didier Henrion, LAAS-CNRS, Toulouse, France; Mohab Safey El Din, Université Paris 6, France

10:30-10:55 Semidefinitely Representable Convex Sets
Claus Scheiderer, Universität Konstanz, Germany

11:00-11:25 Tranfer Function Realizations, Sums of Hermitian Squares, and Determinantal Representations
Victor Vinnikov, Ben-Gurion University, Israel

11:30-11:55 The Relation Between SOS and SONC
Timo de Wolff, Texas A&M University, USA

Friday, August 4
MS88
Theoretical Advances in Numerical Algebraic Geometry - Part II of III
10:00 AM-12:00 PM

Room:Skiles Building - 255

For Part 1 see MS77
For Part 3 see MS99

Numerical Algebraic Geometry is the analysis and development of algorithms for computing with polynomial systems of equations. This minisymposium focuses on the main underlying foundational concepts, that include: the theory of real and complex varieties, root bounds for systems, certification criteria, dual spaces, and specialized objects such as witness sets and homotopy systems. This session focuses on advancements in the theory of numerical algebraic geometry, and how it informs the development of algorithms.

Organizer: Robert Krone
Queen's University, Canada

Organizer: Gregorio Malajovich
Universidade Federal do Rio De Janeiro, Brazil

10:00-10:25 Conic Elimination Technique for Mixed Cells Computation

Tianran Chen, Auburn University Montgomery, USA

10:30-10:55 Solving Polynomial Systems via Homotopy Continuation and Monodromy

Tim Duff and Cvetelina Hill, Georgia Institute of Technology, USA; Anders Jensen, Aarhus University, Denmark; Kisun Lee and Anton Leykin, Georgia Institute of Technology, USA; Jeff Sommars, University of Ilinois at Chicago, USA

11:00-11:25 Computing the Homology of Real Projective Sets

Felipe Cucker, City University of Hong Kong, Hong Kong; *Teresa Krick*, Universidad de Buenos Aires, Argentina; Michael Shub, IMAS, CONICET, Argentina and Graduate School of CUNY

11:30-11:55 Geometry and Topology of the Solution Variety

Carlos Beltrán, Universidad de Cantabria, Spain

Friday, August 4
MS89
Random Algebraic Geometry
10:00 AM-12:00 PM

Room:Skiles Building - 254

This minisymposium is meant to report on the recent activity in the field of random real algebraic geometry: the probabilistic study of classical questions in algebraic geometry, ranging from topology to enumerative geometry. A special feature of real algebraic geometry is the lack of generic statements, as opposed to complex algebraic geometry where generic objects exist and obey simple rules. The simplest example is the problem of counting real zeroes of a real polynomial of degree d, versus its complex zeroes: real zeroes vary depending on some semialgebraic conditions on the coefficients, complex zeroes are exactly d for an open dense set of coefficients. This phenomenon (which ultimately is due to the fact that real discriminants have codimension one) is the prototype of what happens for many different geometric problems: from Hilbert's Sixteenth Problem (the study the "number, shape, and position" of the connected components of a real algebraic hypersurface) to more recent questions in real enumerative geometry. A modern approach to these problems is to adopt a probabilistic point of view. How many zeroes of a random polynomial are real? How many components does a random plane real algebraic curve have? How many real solutions are there to an enumerative problem over the reals, on average? This approach offers a broad point of view by seeking typical properties of random arrangements, and it is particularly well adapted to study problems coming from applied mathematics.

Organizer: Antonio Lerario
International School for Advanced Studies, Trieste, Italy and Florida Atlantic University, USA

Organizer: Peter Bürgisser
Technische Universität Berlin, Germany

10:00-10:25 Probabilistic Schubert Calculus

Peter Bürgisser, Technische Universität Berlin, Germany

10:30-10:55 Percolation of Random Nodal Lines

Damien Gayet, Institut Fourier, Grenoble, France

11:00-11:25 The Number of a Eigenvectors of a Random Tensor

Paul Breiding, Technische Universität Berlin, Germany

11:30-11:55 Random Fields and the Enumerative Geometry of Lines on Real and Complex Hypersurfaces

Erik Lundberg, Florida Atlantic University, USA

Friday, August 4

MS90

Sparse Representation from Moments - Part I of II
10:00 AM-12:00 PM

Room:Skiles Building - 270

For Part 2 see MS101

Recovering structures or models from sampling or measurements is an operation, which appears in many domains and applications. The reconstruction of sparse models from sequences of moments is such a problem, where algebra and geometry are playing an important role. Problems such as cubature formula, sparse interpolation, exponential fitting, polynomial optimization or tensor decomposition can be reformulated in these terms. The minisymposium will to bring together various aspects of the theory of moments and sparse representations and explore their interactions with algebraic geometry and its applications.

Organizer: Cordian Riener
Universität Konstanz, Germany

Organizer: Bernard Mourrain
Inria Sophia Antipolis, France

10:00-10:25 Moment Problems and Inequalities for Power Sums

Bruce Reznick, University of Illinois at Urbana-Champaign, USA

10:30-10:55 Optimization Approaches to Quadrature

Cordian Riener and Markus Schweighofer, Universität Konstanz, Germany

11:00-11:25 Core Variety of a Linear Functional and Truncated Moment Problem

Greg Blekherman, Georgia Institute of Technology, USA; Lawrence A. Fialkow, State University of New York, New Paltz, USA

11:30-11:55 Hankel and Quasi-Hankel Matrix Completion: Performance of the Nuclear Norm Relaxation

Konstantin Usevich and Pierre Comon, Gipsa-Lab, France

Friday, August 4

MS91

Algebraic and Topological Biology - Part III of IV
10:00 AM-12:00 PM

Room:Skiles Building - 005

For Part 2 see MS80
For Part 4 see MS102

Recently there has been an explosion in the use of algebraic tools for modeling biological systems as well as topological data analysis methods for information retrieval from biological and medical data sets. Work in this area relies on the application of algebraic geometry to fully understand the algebraic structures and topological spaces in question and develop robust algorithms for data mining. The topics represented in the list of proposed titles are highly representative of cutting-edge research in this area. Speakers will discuss the use of algebra, topology and geometry to study chromosomal and RNA structures and cell genomics, as well as the inference of phylogenetic tree structures from algebraic-geometric data encoding and the study of neural codes using ideals, their associated varieties, and modules. Aside from the organizer, our speakers include graduate students, postdoctoral researchers, and early-career tenure-track faculty at liberal arts institutions. Additionally, this session will include many non-U.S. speakers and speakers from a broad variety of departmental affiliations.

Organizer: Ruth E. Davidson
University of Illinois at Urbana-Champaign, USA

10:00-10:25 Statistics of Topological RNA Structures

Thomas Li and Christian Reidys, Virginia Tech, USA

10:30-10:55 Finding Steady-states Solution of Fibrin Network Dynamics with Numerical Algebraic Geometry

Francesco Pancaldi, University of Notre Dame, USA

11:00-11:25 A Boolean Network Model of the L-arabinose Operon

Lee Andrew Jenkins, University of Georgia, USA

11:30-11:55 Detecting Binomiality of Chemical Reaction Networks

Thomas Kahle, Universität Magdeburg, Germany

Friday, August 4

MS92

Syzygies and Mu-bases: Theory, Computation, and Applications - Part I of II
10:00 AM-11:30 AM

Room:Skiles Building - 006

For Part 2 see MS103

Syzygies and μ-bases for syzygies play a fundamental role in algorithmic algebraic geometry and geometric modeling. μ-bases for rational planar curves can be used to retrieve both the parametric and implicit equations of these curves. Singularities, their location, number, and types, can also be extracted from the μ-bases of rational planar curves. In addition there is a well-founded theory of μ-bases for rational curves in arbitrary dimensions, and there are fast algorithms for computing a μ-basis for these rational curves from a rational parametrization of the curve. μ-bases for curves are not unique, but their degrees are unique. Thus the degrees of a μ-basis can be used to classify rational curves. For rational surfaces the situation is more complicated. μ-bases exist for rational surfaces, but unlike rational curves, where μ-bases exist relative homogeneous parametrizations, μ-bases for rational surfaces are defined only relative to affine parametrizations. μ-bases for rational surfaces can also be used to retrieve both the parametric and implicit equations of these surfaces, but now extraneous factors may appear. These extraneous factors can be generated both by bases points and by anomalies at infinity. Moreover, μ-bases for rational surface can be difficult to compute. In this minisymposium we shall present the current state of the art in the theory, computation and applications of syzygies and μ-bases for rational curves and surfaces.

Organizer: Ron Goldman
Rice University, USA

Friday, August 4
MS92
Syzygies and Mu-bases: Theory, Computation, and Applications - Part I of II
10:00 AM-11:30 AM

continued

10:00-10:25 Rational Plane Curves, μ Projections, and Degree = 6 and μ= 2

David Cox, Amherst College, USA

10:30-10:55 Implicitizing Rational Tensor Product Surfaces using the Resultant of Three Moving Planes

Liyong Shen, Chinese Academy of Sciences, China; Ron Goldman, Rice University, USA

11:00-11:25 Implicitizing Rational Tensor Product Surfaces by the Resultant of Three Moving Planes

Ron Goldman, Rice University, USA

Friday, August 4
MS93
Euclidean Distance Degree: Theory, Computation and Applications - Part II of II
10:00 AM-12:00 PM

Room:Skiles Building - 268

For Part 1 see MS82

Given a model (i.e. a subset of a real vector space) described by polynomial equations, the Euclidean distance (ED) problem is the optimization problem which seeks to find the nearest model point to a given data point with respect to the Euclidean norm. The number of complex critical points of the polynomial system associated to this problem is called the ED degree and is an invariant of the model. This minisymposium will explore various attributes of the ED problem, highlighting theoretical connections, computational approaches, and applications. Recent developments have illustrated the application of classical constructions and invariants from the intersection theory of projective algebraic varieties to the ED problem. These connections will be discussed, including recent results linking the ED degree of a variety to its conormal variety, polar degrees, and Chern-Mather class. There has also been recent progress in effective techniques to study and solve the ED problem in both particular cases (i.e. secant varieties and toric varieties) and in the general case. Several talks will focus on some of these developments and on related computational methods in real algebraic geometry such as methods to compute the critical points of maps specified by polynomials. ED problems have natural applications. Several of these will be discussed, including applications of the ED degree to computer vision and relations between the ED problem and semi-algebraic geometry.

Organizer: Martin Helmer
University of California, Berkeley, USA

continued in next column

Organizer: Corey Harris
Florida State University, USA

10:00-10:25 Critical Point Computations on Smooth Varieties: Degree and Complexity Bounds

Mohab Safey El Din, Université Pierre et Marie Curie, France

10:30-10:55 Distance Degree in Semialgebraic Geometry

Margaret Stawiska-Friedland, Mathematical Reviews, USA; Shmuel Friedland, University of Illinois, Chicago, USA

11:00-11:25 Data with Infinitely Many Critical Points

Emil Horobet, Sapientia Hungarian University of Transylvania, Romania

11:30-11:55 ED Degrees of Orthogonally Invariant Varieties

Arthur Bik and Jan Draisma, University of Bern, Switzerland

Friday, August 4

MS94

Geometry of Materials - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 271

For Part 2 see MS105

The proposed minisymposium, whose theme is inspired by Kepler's famous dictum ("Ubi materia, ibi geometria" = "Where there is matter, there is geometry") will bring together geometers (algebraic, discrete and computational) and physicists whose work is motivated by or inspired by current problems emerging in materials science and crystallography. Our goal is to facilitate the dissemination of recent geometric questions, results and applications arising in materials science, and to inspire further theoretical advances and improved computational methods. Topics include cellular microstructures, grain growth simulations, framework materials, displacive phase transitions, periodic minimal surfaces and crystal structure, as well as geometric design of materials with unusual properties (metamaterials).

Organizer: Ileana Streinu
Smith College, USA

Organizer: Frank H. Lutz
Technische Universität Berlin, Germany

10:00-10:25 On the Geometry of Steel

Frank H. Lutz, Technische Universität Berlin, Germany

10:30-10:55 Voronoi Geometry and Applications to Structure Classification

Emanuel A. Lazar, University of Pennsylvania, USA

11:00-11:25 Geometry of Flat Origami Triangulations

Bryan G. Chen and Christian Santangelo, University of Massachusetts, USA

11:30-11:55 Simplicial Manifolds with Small Valence

Florian Frick, Cornell University, USA; Frank H. Lutz and John Sullivan, Technische Universität Berlin, Germany

Friday, August 4

MS95

Free Resolutions Governed by Geometric and/or Combinatorial Data - Part I of II

10:00 AM-12:00 PM

Room:Skiles Building - 168

For Part 2 see MS106

In this minisymposium we will focus on the computational aspects of free resolutions of objects arising from geometric and/or combinatorial constructions. Topics should include but are not limited to Rees algebras, fan algebras, multigraded resolutions of ideals of points, and constructions related to ordinary or symbolic powers of ideals. We plan to focus on recent progress in this area that result in explicit computations either of resolutions or of remarkable invariants of resolutions. Exciting new work has been announced recently on these topics and we would like to bring the practitioners of the field, as well as graduate students, up to speed in this fast developing area. We are requesting two blocks, each of 4 talks.

Organizer: Carlos D'Andrea
Universitat de Barcelona, Spain

Organizer: Florian Enescu
Georgia State University, USA

10:00-10:25 On the Resolution of Fan Algebras

Teresa Cortadellas and Carlos D'Andrea, Universitat de Barcelona, Spain; Florian Enescu, Georgia State University, USA

10:30-10:55 Shapes of the Simplest Minimal Free Resolutions in $P^1 \times P^1$

Nicolas Botbol and Alicia Dickenstein, Universidad de Buenos Aires, Argentina; Hal Schenck, University of Illinois, USA

11:00-11:25 Bounding the Degrees of a Minimal μ-Basis for a Rational Surface Parametrization

Yairon Cid Ruiz, University of Barcelona, Spain

11:30-11:55 Syzygies of Tensor Product Surfaces with Basepoints

Eliana M. Duarte, University of Illinois at Urbana-Champaign, USA

Friday, August 4

MS96

Resultants, Subresultants and Applications - Part II of III

10:00 AM-11:30 AM

Room:Skiles Building - 170

For Part 1 see MS85
For Part 3 see MS107

The minisymposium focuses on recent advances on resultant, discriminant and subresultant theory, and their connections with (and applications in) interpolation problems, real root finding, geometric computation, Schur polynomials, polynomial optimization, etc.

Organizer: Teresa Krick
Universidad de Buenos Aires, Argentina

Organizer: Agnes Szanto
North Carolina State University, USA

10:00-10:25 Hilbert's Nullstellensatz and Combinatorial Optimization Problems

Susan Margulies, United States Naval Academy, USA

10:30-10:55 A Local Verification Method for the Solutions of a Zero-dimensional Polynomial Systems

Michael Sagraloff, Max Planck Institute for Informatics, Germany

11:00-11:25 On the Computation of Sparse Resultants

Carlos D'Andrea, Universitat de Barcelona, Spain; *Gabriela Jeronimo*, Universidad de Buenos Aires, Argentina; Martin Sombra, Universitat de Barcelona, Spain

Friday, August 4

CP5

Optimization and Geometry

10:00 AM-11:30 AM

Room:Skiles Building - 171

Chair: Serkan Hosten, San Francisco State University, USA

10:00-10:25 Tropical Optimization Problems: Recent Results and Applications

Nikolai Krivulin, St Petersburg State University, Russia

10:30-10:55 On the S_n-Invariant F-conjecture

David Swinarski and Han-Bom Moon, Fordham University, USA

11:00-11:25 Practical Semialgebraic Geometry for Computer-assisted Proofs

Matthias Koeppe and *Yuan Zhou*, University of California, Davis, USA

Lunch Break

12:00 PM-1:30 PM

Attendees on their own

Friday, August 4

IP10

Talk Title To Be Announced

1:30 PM-2:30 PM

Room:Clough Undergraduate Learning Commons - 152

Chair: Bernard Mourrain, Inria Sophia Antipolis, France

Title not available at time of publication.

Jean-Charles Faugère

Inria Paris-Rocquencourt, France

Coffee Break

2:30 PM-3:00 PM

Room:Skiles Building

Friday, August 4

MS97

Coding Theory - Part IV of IV

3:00 PM-4:30 PM

Room:Skiles Building - 249

For Part 3 see MS86

Coding Theory comes as an answer to the problem of reliable communication over noisy channels. As a research field, Coding Theory intersects Mathematics, Information Theory, and Electrical Engineering. The minisymposium session we propose focuses on the algebraic aspect of the theory of error-correcting codes, both in the context of Classical Coding Theory and Network Coding, a new emerging research field that studies network transmissions. Algebra plays a crucial role in Coding Theory, as it provides the main tools for the construction of error-correcting codes and their analysis.

Organizer: Felice Manganiello
Clemson University, USA

Organizer: Alberto Ravagnani
University of Toronto, Canada

Organizer: Gretchen L. Matthews
Clemson University, USA

3:00-3:25 Extension Theorems for Codes over Frobenius Bimodules

Heide Gluesing-Luerssen and Tefjol Pllaha, University of Kentucky, USA

3:30-3:55 Codes for Distributed Storage from 3-regular Graphs

Shuhong Gao, Fiona Knoll, *Felice Manganiello*, and Gretchen L. Matthews, Clemson University, USA

4:00-4:25 On Semigroup Ideals and Generalized Hamming Weights of AG Codes

Maria Bras-Amorós and Kwankyu Lee, Rovira i Virgili University, Spain

Friday, August 4

MS98

Semidefinite Optimization and Convex Algebraic Geometry - Part IV of IV

3:00 PM-5:00 PM

Room:Skiles Building - 202

For Part 3 see MS87

In the past decade there has been a surge of interest in algebraic approaches to optimization problems defined in terms of multivariate polynomials. Fundamental mathematical challenges that arise in this program include understanding the structure of nonnegative polynomials, the interplay between efficiency and complexity of different representations of algebraic sets, and the development of effective algorithms. Convexity provides a new viewpoint and a powerful framework for addressing these questions. This naturally brings us to the intersection of algebraic geometry, optimization,and convex geometry, with an emphasis on algorithms and computation. This emerging area has become known as convex algebraic geometry. We propose to have 4 minisymposium session to address the full breadth of problems arising in convex algebraic geometry, semidefinite programming and polynomial optimization.

Organizer: Greg Blekherman
Georgia Institute of Technology, USA

Organizer: Joao Gouveia
Universidade de Coimbra, Portugal

Organizer: Daniel Plaumann
Technische Universität Dortmund, Germany

Organizer: Cynthia Vinzant
North Carolina State University, USA

3:00-3:25 Slack Ideals of Polytopes
Joao Gouveia, Universidade de Coimbra, Portugal; Antonio Macchia, Universita degli studi di Bari, Italy; Rekha Thomas and *Amy Wiebe*, University of Washington, USA

3:30-3:55 Symbolic Computation for Hyperbolic Polynomials
Naldi Simone and Daniel Plaumann, Technische Universität Dortmund, Germany

4:00-4:25 Test Sets for Nonnegativity of Reflection-invariant Polynomials
Jose Acevedo, Georgia Institute of Technology, USA; Mauricio Velasco, Universidad de los Andes, Colombia

4:30-4:55 Determinantal Representations of Hyperbolic Plane Curves with Cyclic Invariance
Lillian F. Pasley, North Carolina State University, USA; Konstantinos Lentzos, Technische Universität Dortmund, Germany

Friday, August 4

MS99

Theoretical Advances in Numerical Algebraic Geometry - Part III of III

3:00 PM-5:00 PM

Room:Skiles Building - 255

For Part 2 see MS88

Numerical Algebraic Geometry is the analysis and development of algorithms for computing with polynomial systems of equations. This minisymposium focuses on the main underlying foundational concepts, that include: the theory of real and complex varieties, root bounds for systems, certification criteria, dual spaces, and specialized objects such as witness sets and homotopy systems. This session focuses on advancements in the theory of numerical algebraic geometry, and how it informs the development of algorithms.

Organizer: Robert Krone
Queen's University, Canada

Organizer: Gregorio Malajovich
Universidade Federal do Rio De Janeiro, Brazil

3:00-3:25 Probabilistic Enumerative Geometry
Antonio Lerario, International School for Advanced Studies, Trieste, Italy and Florida Atlantic University, USA

3:30-3:55 A Numerical Method for Solving Real Bi-parametric Systems
Wenyuan Wu, Chinese Academy of Sciences, China; Changbo Chen and Yong Feng, Chongqing Institute of Green and Intelligent Technology, and Chinese Academy of Sciences, China

4:00-4:25 Certification of Approximate Roots of Polynomial Systems
Tulay Ayyildiz Akoglu and Agnes Szanto, North Carolina State University, USA; Jon Hauenstein, University of Notre Dame, USA

4:30-4:55 Numerical Irreducible Decomposition for Multiprojective Varieties
Frank Sottile, Texas A&M University, USA

Friday, August 4

MS100

Random Commutative Algebra

3:00 PM-5:00 PM

Room:Skiles Building - 254

Randomness and stochasticity have long been used in the algebra of polynomial rings. For example, already in the 1930's, Littlewood and Offord studied the expected number of real roots of a random algebraic equation. Such investigations on random varieties, defined by random coefficients, attracted a lot of work now considered classical. This session brings together researchers interested in further using statistical and probabilistic thinking for studying properties of polynomial rings as well as to improve computation analysis.

Organizer: Despina Stasi
Illinois Institute of Technology, USA

Organizer: Jesus De Loera
University of California, Davis, USA

Organizer: Sonja Petrovic
Illinois Institute of Technology, USA

3:00-3:25 Randomization in Computational and Commutative Algebra

Despina Stasi, Illinois Institute of Technology, USA

3:30-3:55 Random Monomial Ideals

Lily Silverstein, University of California, Davis, USA

4:00-4:25 Random Numerical Semigroups

Dane Wilburne, Illinois Institute of Technology, USA; Jesus De Loera and Chris O'Neill, University of California, Davis, USA

4:30-4:55 Syzygies of Random Stanley-Reisner Ideals

Daniel M. Erman, University of Wisconsin, Madison, USA

Friday, August 4

MS101

Sparse Representation from Moments - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 270

For Part 1 see MS90
Recovering structures or models from sampling or measurements is an operation, which appears in many domains and applications. The reconstruction of sparse models from sequences of moments is such a problem, where algebra and geometry are playing an important role. Problems such as cubature formula, sparse interpolation, exponential fitting, polynomial optimization or tensor decomposition can be reformulated in these terms. The minisymposium will to bring together various aspects of the theory of moments and sparse representations and explore their interactions with algebraic geometry and its applications.

Organizer: Cordian Riener
Universität Konstanz, Germany

Organizer: Bernard Mourrain
Inria Sophia Antipolis, France

3:00-3:25 Structured Matrices Arising in Multivariate Polynomial Problems

George Labahn, University of Waterloo, Canada; Bernhard Beckermann, Universite de Lille, France; Evelyne Hubert, Inria Méditerranée, France

3:30-3:55 Moment Problems for Symmetric Algebras of Locally Convex Spaces

Salma Kuhlmann, Universität Konstanz, Germany

4:00-4:25 Decomposition of Polynomial-exponential Series from Moments

Bernard Mourrain, Inria Sophia Antipolis, France

4:30-4:55 Truncated Moment Problems for Unital Commutative Real Algebras

Maria Infusino, Universität Konstanz, Germany

Friday, August 4

MS102

Algebraic and Topological Biology - Part IV of IV

3:00 PM-5:00 PM

Room:Skiles Building - 005

For Part 3 see MS91
Recently there has been an explosion in the use of algebraic tools for modeling biological systems as well as topological data analysis methods for information retrieval from biological and medical data sets. Work in this area relies on the application of algebraic geometry to fully understand the algebraic structures and topological spaces in question and develop robust algorithms for data mining. The topics represented in the list of proposed titles are highly representative of cutting-edge research in this area. Speakers will discuss the use of algebra, topology and geometry to study chromosomal and RNA structures and cell genomics, as well as the inference of phylogenetic tree structures from algebraic-geometric data encoding and the study of neural codes using ideals, their associated varieties, and modules. Aside from the organizer, our speakers include graduate students, postdoctoral researchers, and early-career tenure-track faculty at liberal arts institutions. Additionally, this session will include many non-U.S. speakers and speakers from a broad variety of departmental affiliations.

Organizer: Ruth E. Davidson
University of Illinois at Urbana-Champaign, USA

3:00-3:25 Grobner Bases of Neural Ideals

Rebecca Garcia and Luis David Garcia Puente, Sam Houston State University, USA; Ryan Kruse, Central College, USA; Jessica Liu, Bard College, USA; Dane Miyata, Willamette University, USA; Ethan Petersen, Rose-Hulman Institute of Technology, Israel; Kaitlyn Phillipson, St. Edwards University, USA; *Anne Shiu*, Texas A&M University, USA

3:30-3:55 Neural Ideals and Stimulus Space Visualization

Nora Youngs, Colby College, USA; Elizabeth Gross, San Jose State University, USA

4:00-4:25 Real Multigraded Modules as Data Structures for Fly Wings

Justin Curry, Ezra Miller, and *Ashleigh Thomas*, Duke University, USA

4:30-4:55 Persistence of Convex Codes, Inferring the Rank of Non-linear Matrix Factorizations and the Space of Smells

Vladimir Itskov, Pennsylvania State University, USA

Friday, August 4
MS103
Syzygies and Mu-bases: Theory, Computation, and Applications - Part II of II
3:00 PM-4:30 PM

Room:Skiles Building - 006

For Part 1 see MS92

Syzygies and µ-bases for syzygies play a fundamental role in algorithmic algebraic geometry and geometric modeling. µ-bases for rational planar curves can be used to retrieve both the parametric and implicit equations of these curves. Singularities, their location, number, and types, can also be extracted from the µ-bases of rational planar curves. In addition there is a well-founded theory of µ-bases for rational curves in arbitrary dimensions, and there are fast algorithms for computing a µ-basis for these rational curves from a rational parametrization of the curve. µ-bases for curves are not unique, but their degrees are unique. Thus the degrees of a µ-basis can be used to classify rational curves. For rational surfaces the situation is more complicated. µ-bases exist for rational surfaces, but unlike rational curves, where µ-bases exist relative homogeneous parametrizations, µ-bases for rational surfaces are defined only relative to affine parametrizations. µ-bases for rational surfaces can also be used to retrieve both the parametric and implicit equations of these surfaces, but now extraneous factors may appear. These extraneous factors can be generated both by bases points and by anomalies at infinity. Moreover, µ-bases for rational surface can be difficult to compute. In this minisymposium we shall present the current state of the art in the theory, computation and applications of syzygies and µ-bases for rational curves and surfaces.

Organizer: Ron Goldman
Rice University, USA

3:00-3:25 Computing Singularities of Rational Curves and Surfaces using their Mu-bases

Xiaohong Jia, Chinese Academy of Sciences, China

3:30-3:55 Degree-optimal Moving Frame for Rational Curves

Irina Kogan, Hoon Hong, and Zachary Hough, North Carolina State University, USA

4:00-4:25 Algorithm for Computing µ-Bases of Univariate Polynomials

Zachary Hough, Hoon Hong, and Irina Kogan, North Carolina State University, USA

Friday, August 4

MS104

Likelihood Geometry

3:00 PM-5:00 PM

Room:Skiles Building - 268

Maximum likelihood estimation is a fundamental problem in statistics. By studying the geometry of this problem one is able to gain new insights. These insights lead to connections to Euler characteristics, maximum likelihood degrees, and toric varieties.

Organizer: Jose I. Rodriguez
University of Chicago, USA

Organizer: Serkan Hosten
San Francisco State University, USA

3:00-3:25 Introduction to Maximum Likelihood Degrees
Jose Rodriguez, University of Chicago, USA

3:30-3:55 Maximum Likelihood Degrees for Discrete Random Models
Courtney Gibbons, Hamilton College, USA

4:00-4:25 Maximum Likelihood Estimation for Cubic and Quartic Canonical Toric Del Pezzo Surfaces
Dimitra Kosta, University of Edinburgh, United Kingdom

4:30-4:55 Topological Invariants and the Maximum Likelihood Degree
Martin Helmer, University of California, Berkeley, USA; Jose I. Rodriguez, University of Chicago, USA; Serkan Hosten, San Francisco State University, USA

Friday, August 4

MS105

Geometry of Materials - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 271

For Part 1 see MS94
The proposed minisymposium, whose theme is inspired by Kepler's famous dictum ("Ubi materia, ibi geometria" = "Where there is matter, there is geometry") will bring together geometers (algebraic, discrete and computational) and physicists whose work is motivated by or inspired by current problems emerging in materials science and crystallography. Our goal is to facilitate the dissemination of recent geometric questions, results and applications arising in materials science, and to inspire further theoretical advances and improved computational methods. Topics include cellular microstructures, grain growth simulations, framework materials, displacive phase transitions, periodic minimal surfaces and crystal structure, as well as geometric design of materials with unusual properties (metamaterials).

Organizer: Ileana Streinu
Smith College, USA

Organizer: Frank H. Lutz
Technische Universität Berlin, Germany

3:00-3:25 Defects in Three Dimensional Smectics and their Combination Rules
Thomas Machon, University of Pennsylvania, USA

3:30-3:55 Twisted Topological Tangles or: The Knot Theory of Knitting
Elisabetta A. Matsumoto, Georgia Institute of Technology, USA

4:00-4:25 Auxetic and Expansive: Beyond Two Dimensions
Ciprian S. Borcea, Rider University, USA; *Ileana Streinu*, Smith College, USA

4:30-4:55 Periodic Auxetics: Elliptic Curves, Convexity Constraints and Framework Generation
Ciprian S. Borcea, Rider University, USA; Ileana Streinu, Smith College, USA

Friday, August 4

MS106

Free Resolutions Governed by Geometric and/or Combinatorial Data - Part II of II

3:00 PM-5:00 PM

Room:Skiles Building - 168

For Part 1 see MS95
In this minisymposium we will focus on the computational aspects of free resolutions of objects arising from geometric and/or combinatorial constructions. Topics should include but are not limited to Rees algebras, fan algebras, multigraded resolutions of ideals of points, and constructions related to ordinary or symbolic powers of ideals. We plan to focus on recent progress in this area that result in explicit computations either of resolutions or of remarkable invariants of resolutions. Exciting new work has been announced recently on these topics and we would like to bring the practitioners of the field, as well as graduate students, up to speed in this fast developing area. We are requesting two blocks, each of 4 talks.

Organizer: Florian Enescu
Georgia State University, USA

Organizer: Carlos D'Andrea
Universitat de Barcelona, Spain

3:00-3:25 Resolutions Associated to a Matrix of Linear Forms which is Annihilated by a Vector of Indeterminates
Andrew Kustin, University of South Carolina, USA

3:30-3:55 Castelnuovo-Mumford Regularity vs. Virtual Cohomological Dimension
Alexandru Constantinescu, University of Genova, Italy

4:00-4:25 When are the Symbolic Powers of an Ideal Equal to its Ordinary Powers?

Alexandra Seceleanu, University of Nebraska, Lincoln, USA; Susan Cooper, North Dakota State University, USA; Giuliana Fattabi, University of Perugia, Italy; Elena Guardo, Universita' di Catania, Italy; Anna Lorenzini, University of Perugia, Italy; Juan Migliore, Notre Dame University, USA; Uwe Nagel, University of Kentucky, USA; Justina Szpond, Pedagogical University of Kraków, Russia; Adam Van Tuyl, McMaster University, Canada

4:30-4:55 Properties of Symmetric Ideals

Uwe Nagel, University of Kentucky, USA

Friday, August 4

MS107

Resultants, Subresultants and Applications - Part III of III

3:00 PM-5:00 PM

Room:Skiles Building - 170

For Part 2 see MS96

The minisymposium focuses on recent advances on resultant, discriminant and subresultant theory, and their connections with (and applications in) interpolation problems, real root finding, geometric computation, Schur polynomials, polynomial optimization, etc.

Organizer: Teresa Krick
Universidad de Buenos Aires, Argentina

Organizer: Agnes Szanto
North Carolina State University, USA

3:00-3:25 Sylvester Sums in Multiple Roots and Subresultants

Marcelo A. Valdettaro, Universidad de Buenos Aires, Argentina; Carlos D'Andrea, Universitat de Barcelona, Spain; Teresa Krick, Universidad de Buenos Aires, Argentina; Agnes Szanto, North Carolina State University, USA

3:30-3:55 Sylvester Double Sums and Subresultants in the General Case

Aviva Szpirglas, Université de Poitiers, France

4:00-4:25 Chebyshev Multivariate Sparse Interpolation

Evelyne Hubert, Inria Méditerranée, France; Michael Singer, North Carolina State University, USA
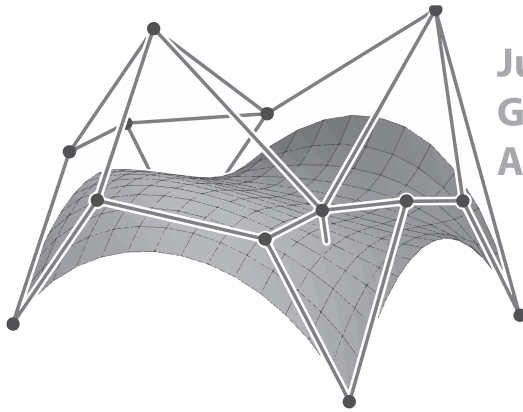
4:30-4:55 Irredundant Decomposition of Radical Ideals via Triangular Sets

Gleb Pogudin, Johannes Kepler Universität, Linz, Austria

Notes

AG17 Abstracts

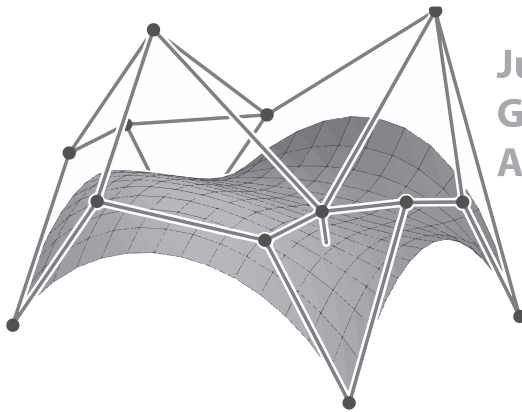## SIAM Conference on
Applied Algebraic Geometry

July 31 – August 4, 2017
Georgia Institute of Technology
Atlanta, Georgia, USA

Abstracts are printed as submitted by the authors.

Organizer and Speaker Index

SIAM Conference on
Applied Algebraic Geometry

July 31 – August 4, 2017
Georgia Institute of Technology
Atlanta, Georgia, USA

A

Aamari, Eddie, MS37, 3:30 Tue

Abe, Hiraki, MS3, 11:30 Mon

Abelard, Simon, MS11, 3:30 Mon

Abo, Hirotachi, MS25, 11:00 Tue

Acevedo, Jose, MS98, 4:00 Fri

Adamer, Michael F., MS83, 4:30 Thu

Adams, Henry, MS40, 3:00 Tue

Adams, Henry, MS51, 10:00 Wed

Adams, Henry, MS62, 3:00 Wed

Ahmadi, Amir Ali, MS32, 4:00 Tue

Aliev, Iskander, MS2, 11:30 Mon

Alter, Orly, MS35, 4:30 Tue

Amendola Ceron, Carlos, MS17, 3:00 Mon

Asuaga, Javier, MS80, 4:30 Thu

Augot, Daniel, MS64, 11:00 Thu

Averkov, Gennadiy, MS2, 10:30 Mon

Ayyildiz Akoglu, Tulay, MS99, 4:00 Fri

B

Bajbar, Tomas, MS32, 4:30 Tue

Ballentine, Sean F., MS53, 4:00 Wed

Banos Cervantes, Hector D., MS48, 10:30 Wed

Barg, Alexander, MS42, 10:00 Wed

Barg, Alexander, MS42, 10:00 Wed

Barg, Alexander, MS53, 3:00 Wed

Bartoli, Daniele, CP2, 3:30 Tue

Basu, Amitabh, MS2, 10:00 Mon

Bathala, Srinivasulu, CP2, 4:00 Tue

Batkhin, Alexander B., CP1, 10:30 Tue

Batkhin, Alexander B., CP4, 10:30 Thu

Beltrán, Carlos, IP2, 1:30 Mon

Beltrán, Carlos, MS88, 11:30 Fri

Benedetti, Bruno, MS40, 3:00 Tue

Bernardi, Alessandra, MS25, 10:00 Tue

Bernstein, Daniel J., MS11, 3:00 Mon

Bernstein, Daniel I., MS38, 4:00 Tue

Bhatia, Sangeeta, MS69, 10:30 Thu

Bik, Arthur, MS93, 11:30 Fri

Birner, Katharina, MS71, 11:30 Thu

Blekherman, Greg, MS65, 10:00 Thu

Blekherman, Greg, MS76, 3:00 Thu

Blekherman, Greg, MS87, 10:00 Fri

Blekherman, Greg, MS90, 11:00 Fri

Blekherman, Greg, MS98, 3:00 Fri

Bliss, Nathan, MS33, 3:00 Tue

Bocci, Cristiano, MS29, 10:00 Tue

Bocci, Cristiano, MS25, 11:30 Tue

Bocci, Cristiano, MS39, 3:00 Tue

Boehm, Janko, MS67, 11:00 Thu

Borcea, Ciprian S., MS105, 4:30 Fri

Bossinger, Lara, MS3, 10:30 Mon

Botbol, Nicolas, MS95, 10:30 Fri

Bracco, Cesare, MS71, 10:00 Thu

Brake, Dani, MS44, 10:00 Wed

Brake, Dani, MS55, 3:00 Wed

Brake, Dani, MS66, 10:00 Thu

Bras-Amorós, Maria, MS97, 4:00 Fri

Brecheteau, Claire, MS27, 10:30 Tue

Breiding, Paul, MS89, 11:00 Fri

Brunner, James, MS50, 11:00 Wed

Brysiewicz, Taylor, MS77, 3:00 Thu

Buczynski, Jaroslaw, MS25, 10:30 Tue

Buergisser, Peter, MS79, 3:30 Thu

Bürgisser, Peter, MS89, 10:00 Fri

Bürgisser, Peter, MS89, 10:00 Fri

Burr, Michael A., MS14, 3:30 Mon

C

Camara, Pablo, MS80, 3:30 Thu

Cameron, Karleigh, MS66, 11:00 Thu

Caminata, Alessio, MS1, 10:00 Mon

Caminata, Alessio, MS11, 3:00 Mon

Caminata, Alessio, MS21, 10:00 Tue

Caminata, Alessio, MS21, 11:30 Tue

Cappelletti, Daniele, MS61, 4:00 Wed

Carlini, Enrico, MS46, 11:30 Wed

Cartwright, Dustin, MS84, 3:00 Thu

Chakrabarty, Deeparnab, MS12, 3:30 Mon

Chandrasekaran, Venkat, MS43, 10:30 Wed

Chen, Bryan G., MS94, 11:00 Fri

Chen, Hao, MS21, 10:00 Tue

Chen, Shaoshi, MS10, 10:00 Mon

Chen, Shaoshi, MS20, 3:00 Mon

Chen, Shaoshi, MS30, 10:00 Tue

Chen, Tianran, MS33, 3:00 Tue

Chen, Tianran, MS44, 10:00 Wed

Chen, Tianran, MS88, 10:00 Fri

Cheng, Jinsan, MS4, 11:30 Mon

Chiantini, Luca, MS25, 10:00 Tue

Chiantini, Luca, MS39, 3:00 Tue

Chiantini, Luca, MS46, 10:00 Wed

Chifman, Julia, MS58, 3:00 Wed

Chua, Lynn, MS54, 3:30 Wed

Chum, Kenneth, MS42, 11:00 Wed

Cid Ruiz, Yairon, MS95, 11:00 Fri

Cifuentes, Diego, MS18, 4:30 Mon

Collins, James B., MS77, 4:30 Thu

Conradi, Carsten, MS50, 10:00 Wed

Conradi, Carsten, MS50, 10:00 Wed

Conradi, Carsten, MS61, 3:00 Wed

Conradi, Carsten, MS72, 10:00 Thu

Conradi, Carsten, MS83, 3:00 Thu

Constantinescu, Alexandru, MS106, 3:30 Fri

Coons, Jane, MS6, 10:30 Mon

Corey, Dan, MS22, 11:00 Tue

Cortadellas, Teresa, MS95, 10:00 Fri

Coss, Owen, CP1, 10:00 Tue

Cox, David, MS92, 10:00 Fri

Craciun, Gheorghe, IP4, 1:30 Tue

Craciun, Gheorghe, MS50, 10:00 Wed

Craciun, Gheorghe, MS61, 3:00 Wed

Craciun, Gheorghe, MS72, 10:00 Thu

Craciun, Gheorghe, MS83, 3:00 Thu

Crawford, Lorin, MS37, 3:00 Tue

Curry, Justin, MS52, 10:00 Wed

Italicized names indicate session organizers

Curry, Justin, MS63, 3:00 Wed

Curry, Justin, MS74, 10:00 Thu

Curto, Carina, MS31, 10:30 Tue

Cuyt, Annie, MS5, 10:00 Mon

Cuyt, Annie, MS15, 3:00 Mon

D

D'Andrea, Carlos, MS85, 3:30 Thu

D'Andrea, Carlos, MS95, 10:00 Fri

D'Andrea, Carlos, MS106, 3:00 Fri

Davidson, Ruth E., MS69, 10:00 Thu

Davidson, Ruth E., MS69, 10:00 Thu

Davidson, Ruth E., MS80, 3:00 Thu

Davidson, Ruth E., MS91, 10:00 Fri

Davidson, Ruth E., MS102, 3:00 Fri

De Loera, Jesus, MS2, 10:00 Mon

De Loera, Jesus, MS12, 3:00 Mon

De Loera, Jesus, MS100, 3:00 Fri

De Loera, Jesús A., IP9, 8:30 Fri

de Wolff, Timo, MS32, 3:00 Tue

de Wolff, Timo, MS32, 3:30 Tue

de Wolff, Timo, MS43, 10:00 Wed

de Wolff, Timo, MS54, 3:00 Wed

de Wolff, Timo, MS87, 11:30 Fri

Degnan, James H., MS69, 11:00 Thu

Delucchi, Emanuele, MS40, 3:30 Tue

Dey, Santanu, MS12, 3:00 Mon

Diaz-Toca, Gema M., MS85, 4:00 Thu

Dickenstein, Alicia, MS61, 3:30 Wed

Dimitrova, Elena S., MS31, 10:00 Tue

Dimitrova, Elena S., MS41, 3:00 Tue

Ding, Jintai, MS21, 10:30 Tue

DiPasquale, Michael, MS49, 10:00 Wed

DiPasquale, Michael, MS49, 10:00 Wed

DiPasquale, Michael, MS60, 3:00 Wed

DiPasquale, Michael, MS71, 10:00 Thu

Disanto, Filippo, MS16, 4:00 Mon

Dochtermann, Anton, MS51, 11:30 Wed

Domanov, Ignat, MS15, 4:00 Mon

Draisma, Jan, MS46, 10:00 Wed

Dreesen, Philippe, MS5, 11:00 Mon

Drellich, Elizabeth, MS56, 3:00 Wed

Drendel, Jesse W., MS33, 4:00 Tue

Dressler, Mareike, MS54, 4:00 Wed

Drton, Mathias, MS48, 11:00 Wed

Duarte, Eliana M., MS95, 11:30 Fri

Duff, Tim, MS88, 10:30 Fri

Dufresne, Emilie, MS34, 3:00 Tue

Dumas, Philippe, MS10, 10:00 Mon

Durden, Chris, MS17, 4:00 Mon

Duursma, Iwan, CP2, 4:30 Tue

E

Edelsbrunner, Herbert, IP5, 8:30 Wed

Edwards, Parker, MS66, 11:30 Thu

Eggermont, Rob H., CP3, 3:30 Wed

Eisenberg, Marisa, MS7, 11:30 Mon

Enescu, Florian, MS95, 10:00 Fri

Enescu, Florian, MS106, 3:00 Fri

Ergur, Alperen, MS76, 3:00 Thu

Erman, Daniel M., MS100, 4:30 Fri

Escobar, Laura, MS8, 10:30 Mon

Eytard, Jean Bernard, MS84, 3:30 Thu

F

Farnsworth, Cameron L., MS29, 10:00 Tue

Farnsworth, Cameron L., MS29, 10:00 Tue

Farnsworth, Cameron L., MS39, 3:00 Tue

Fasy, Brittany, MS27, 10:00 Tue

Fasy, Brittany, MS37, 3:00 Tue

Faugère, Jean-Charles, IP10, 1:30 Fri

Fawzi, Hamza, MS65, 10:00 Thu

Fischer, Ilse, MS10, 10:30 Mon

Forcey, Stefan, MS6, 11:00 Mon

Francis, Andrew, MS80, 3:00 Thu

Frick, Florian, MS40, 3:00 Tue

Frick, Florian, MS51, 10:00 Wed

Frick, Florian, MS62, 3:00 Wed

Frick, Florian, MS94, 11:30 Fri

Friedland, Shmuel, MS35, 3:00 Tue

Friedland, Shmuel, MS35, 3:30 Tue

Frolov, Evgeny, MS39, 4:00 Tue

G

Gallardo, Patricio, MS16, 4:30 Mon

Gallet, Matteo, MS45, 11:00 Wed

Gao, Tingran, MS37, 4:00 Tue

Gao, Xiaoshan, CP3, 3:00 Wed

Garcia Puente, Luis David, MS48, 11:30 Wed

Garcia Trillos, Nicolas, MS63, 3:00 Wed

Garoufalidis, Stavros, MS10, 11:00 Mon

Gasparovic, Ellen, MS52, 11:00 Wed

Gaubert, Stephane, MS76, 3:30 Thu

Gavryushkin, Alex, MS26, 10:30 Tue

Gayet, Damien, MS89, 10:30 Fri

Ge, Rong, MS68, 10:30 Thu

Geil, Olav, MS86, 11:30 Fri

Gibbons, Courtney, MS104, 3:30 Fri

Gittenberger, Bernhard, MS20, 3:00 Mon

Gluesing-Luerssen, Heide, MS97, 3:00 Fri

Gnacadja, Gilles, MS83, 3:00 Thu

Goel, Charu, MS24, 11:00 Tue

Goldman, Ron, MS92, 10:00 Fri

Goldman, Ron, MS92, 11:00 Fri

Goldman, Ron, MS103, 3:00 Fri

Gonzalez-Vega, Laureano, MS85, 4:30 Thu

Görlach, Paul, MS34, 3:30 Tue

Goudarzi Karim, Ramin, MS5, 10:30 Mon

Gouveia, Joao, MS65, 10:00 Thu

Gouveia, Joao, MS76, 3:00 Thu

Gouveia, Joao, MS87, 10:00 Fri

Gouveia, Joao, MS98, 3:00 Fri

Greenwood, Torin, MS20, 3:30 Mon

Grindstaff, Gill, MS47, 10:00 Wed

Gross, Elizabeth, MS55, 3:00 Wed

Gross, Elizabeth, MS70, 10:00 Thu

Gross, Elizabeth, MS81, 3:00 Thu

Italicized names indicate session organizers

Güneri, Cem, MS86, 11:00 Fri

Gupte, Akshay, MS12, 4:30 Mon

Gustavson, Richard S., CP1, 11:00 Tue

H

Haas, John, MS19, 4:00 Mon

Hall, Georgina, MS76, 4:00 Thu

Hammen, Nathaniel, MS19, 4:30 Mon

Han, Lixing, MS44, 11:30 Wed

Hanselka, Christoph, MS43, 10:00 Wed

Hansen, Mads C., MS61, 4:30 Wed

Hao, Wenrui, MS55, 4:30 Wed

Harris, Corey, MS82, 3:00 Thu

Harris, Corey, MS93, 10:00 Fri

Hauenstein, Jonathan, MS14, 3:00 Mon

Hauer, Michael, MS45, 10:30 Wed

He, Qijun, MS31, 11:00 Tue

Heal, Kathryn H., PP1, 5:00 Mon

Hein, Nickolas, MS55, 3:30 Wed

Helmer, Martin, MS82, 3:00 Thu

Helmer, Martin, MS82, 3:30 Thu

Helmer, Martin, MS93, 10:00 Fri

Helmer, Martin, MS104, 4:30 Fri

Henrion, Didier, MS87, 10:00 Fri

Henselman, Greg, MS74, 11:00 Thu

Heo, Giseon, MS27, 11:30 Tue

Hildebrand, Robert, MS54, 3:00 Wed

Hofscheier, Johannes, MS78, 3:30 Thu

Horobet, Emil, MS93, 11:00 Fri

Hosten, Serkan, MS59, 3:30 Wed

Hosten, Serkan, MS104, 3:00 Fri

Hough, Zachary, MS103, 4:00 Fri

Hubert, Evelyne, MS24, 10:00 Tue

Hubert, Evelyne, MS34, 3:00 Tue

Hubert, Evelyne, MS34, 4:30 Tue

Hubert, Evelyne, MS107, 4:00 Fri

Hugounenq, Cyril, MS1, 11:00 Mon

Hulzebos, Dani, MS42, 10:30 Wed

Hur, Youngmi, MS39, 3:30 Tue

I

Infusino, Maria, MS101, 4:30 Fri

Iosif, Alexandru, MS67, 11:30 Thu

Ishteva, Mariya, MS5, 10:00 Mon

Ishteva, Mariya, MS5, 10:00 Mon

Ishteva, Mariya, MS15, 3:00 Mon

Itskov, Vladimir, MS102, 4:30 Fri

Iverson, Joseph, MS9, 11:00 Mon

J

Jamshidi, Sara, MS68, 10:00 Thu

Jao, David, MS1, 11:30 Mon

Jarrah, Abdul Salam, MS31, 11:30 Tue

Jenkins, Lee Andrew, MS91, 11:00 Fri

Jensen, Anders, MS73, 10:00 Thu

Jensen, Anders, MS84, 3:00 Thu

Jeronimo, Gabriela, MS96, 11:00 Fri

Jia, Xiaohong, MS103, 3:00 Fri

Johnston, Ann, MS56, 4:00 Wed

Johnston, Matthew D., MS72, 10:00 Thu

Joshi, Badal, MS83, 3:30 Thu

K

Kahle, David, MS70, 10:00 Thu

Kahle, David, MS70, 10:00 Thu

Kahle, David, MS81, 3:00 Thu

Kahle, Thomas, MS67, 10:00 Thu

Kahle, Thomas, MS78, 3:00 Thu

Kahle, Thomas, MS91, 11:30 Fri

Kaihnsa, Nidhi, PP1, 5:00 Mon

Kang, Qiwen, MS36, 4:00 Tue

Karwa, Vishesh, MS81, 3:00 Thu

Kastner, Lars, MS78, 4:00 Thu

Katthän, Lukas, MS67, 10:00 Thu

Kauers, Manuel, MS10, 10:00 Mon

Kauers, Manuel, MS10, 11:30 Mon

Kauers, Manuel, MS20, 3:00 Mon

Kauers, Manuel, MS30, 10:00 Tue

Kaveh, Kiumars, MS22, 10:00 Tue

Kileel, Joe, MS18, 3:30 Mon

King, Emily, MS9, 10:00 Mon

King, Emily, MS19, 3:00 Mon

King, Emily, CP4, 10:00 Thu

Koeppe, Matthias, MS12, 4:00 Mon

Kogan, Irina, MS103, 3:30 Fri

Kohn, Kathlén, MS67, 10:30 Thu

Kosta, Dimitra, MS104, 4:00 Fri

Krick, Teresa, MS85, 3:00 Thu

Krick, Teresa, MS96, 10:00 Fri

Krick, Teresa, MS88, 11:00 Fri

Krick, Teresa, MS107, 3:00 Fri

Krishnamoorthy, Bala, MS80, 4:00 Thu

Krivulin, Nikolai, CP5, 10:00 Fri

Krone, Robert, MS24, 11:30 Tue

Krone, Robert, MS77, 3:00 Thu

Krone, Robert, MS88, 10:00 Fri

Krone, Robert, MS99, 3:00 Fri

Kruff, Niclas, MS34, 4:00 Tue

Kubjas, Kaie, MS79, 3:00 Thu

Kuhlmann, Salma, MS101, 3:30 Fri

Kukelova, Zuzana, MS18, 3:00 Mon

Kumar, Vijay, MS53, 4:30 Wed

Kummer, Mario, MS43, 11:30 Wed

Kustin, Andrew, MS106, 3:00 Fri

L

Labahn, George, MS101, 3:00 Fri

Ladisch, Frieder, MS2, 11:00 Mon

Lairez, Pierre, SP1, 5:15 Wed

Landsberg, Joseph M., IP1, 8:30 Mon

Lange, Tanja, MS1, 10:00 Mon

Lao, Angelyn R., MS50, 10:30 Wed

Laubenbacher, Reinhard, MS41, 3:00 Tue

Lawhorn, MaLyn, MS16, 3:30 Mon

Lazar, Emanuel A., MS94, 10:30 Fri

Lee, Tsung-Lin, MS66, 10:30 Thu

Lee, Wen-shin, MS5, 10:00 Mon

Lee, Wen-shin, MS15, 3:00 Mon

Lee, Wen-shin, MS15, 3:00 Mon

Lerario, Antonio, MS89, 10:00 Fri

Lerario, Antonio, MS99, 3:00 Fri

Li, Nan, MS77, 4:00 Thu

Li, Thomas, MS91, 10:00 Fri

Li, Ziming, MS30, 10:30 Tue

Lieblich, Max, MS8, 10:00 Mon

Lieblich, Max, MS18, 3:00 Mon

Lim, Lek-Heng, MS57, 4:00 Wed

Lin, Bo, MS47, 11:00 Wed

Little, John B., MS53, 3:00 Wed

Loho, Georg, MS84, 4:00 Thu

Long, Colby, MS17, 3:30 Mon

Lowengrub, Daniel, MS82, 4:00 Thu

Lundberg, Erik, MS89, 11:30 Fri

Lutz, Frank H., MS62, 3:00 Wed

Lutz, Frank H., MS94, 10:00 Fri

Lutz, Frank H., MS94, 10:00 Fri

Lutz, Frank H., MS105, 3:00 Fri

M

Macauley, Matthew, MS31, 10:00 Tue

Macauley, Matthew, MS41, 3:00 Tue

Machon, Thomas, MS105, 3:00 Fri

Maclagan, Diane, MS73, 11:00 Thu

Magron, Victor, MS76, 4:30 Thu

Malajovich, Gregorio, MS77, 3:00 Thu

Malajovich, Gregorio, MS77, 3:30 Thu

Malajovich, Gregorio, MS88, 10:00 Fri

Malajovich, Gregorio, MS99, 3:00 Fri

Malikiosis, Romanos D., MS19, 3:30 Mon

Malmskog, Beth, MS42, 11:30 Wed

Mamouni, My Ismail I., CP4, 11:00 Thu

Manganiello, Felice, MS97, 3:00 Fri

Manganiello, Felice, MS97, 3:30 Fri

Manon, Chris, MS22, 10:30 Tue

Mantzaflaris, Angelos, MS4, 10:00 Mon

Mantzaflaris, Angelos, MS4, 10:00 Mon

Mantzaflaris, Angelos, MS14, 3:00 Mon

Mantzaflaris, Angelos, MS45, 10:00 Wed

Margulies, Susan, MS96, 10:00 Fri

Markovsky, Ivan, MS5, 10:00 Mon

Markovsky, Ivan, MS15, 3:00 Mon

Martinez-Penas, Umberto, MS86, 10:30 Fri

Massierer, Maike, MS1, 10:00 Mon

Massierer, Maike, MS11, 3:00 Mon

Massierer, Maike, MS11, 4:30 Mon

Massierer, Maike, MS21, 10:00 Tue

Mathews, James, MS18, 4:00 Mon

Matsumoto, Elisabetta A., MS105, 3:30 Fri

Matthews, Gretchen L., MS64, 10:00 Thu

Matthews, Gretchen L., MS64, 10:30 Thu

Matthews, Gretchen L., MS75, 3:00 Thu

Matthews, Gretchen L., MS86, 10:00 Fri

Matthews, Gretchen L., MS97, 3:00 Fri

Medard, Muriel, MS64, 10:00 Thu

Mehta, Dhagash, MS55, 4:00 Wed

Melczer, Stephen, MS10, 10:00 Mon

Melczer, Stephen, MS20, 3:00 Mon

Melczer, Stephen, MS14, 4:00 Mon

Melczer, Stephen, MS30, 10:00 Tue

Melczer, Stephen, MS30, 11:00 Tue

Meshkat, Nicolette, MS7, 10:00 Mon

Meshkat, Nicolette, MS7, 10:00 Mon

Meshkat, Nicolette, MS17, 3:00 Mon

Meshkat, Nicolette, MS50, 11:30 Wed

Mete, Pinar, CP3, 4:00 Wed

Micheli, Giacomo, CP2, 3:00 Tue

Milione, Piermarco, MS75, 3:30 Thu

Mishna, Marni, MS30, 10:00 Tue

Mito, Leonardo M., PP1, 5:00 Mon

Mixon, Dustin, IP8, 1:30 Thu

Mixon, Dustin, MS9, 10:00 Mon

Mixon, Dustin, MS19, 3:00 Mon

Mohammadi, Fatemeh, MS3, 11:00 Mon

Morrison, Ralph, MS73, 11:30 Thu

Motta, Francis, MS52, 10:00 Wed

Mou, Chenqi, MS45, 11:30 Wed

Mourrain, Bernard, MS60, 3:00 Wed

Mourrain, Bernard, MS90, 10:00 Fri

Mourrain, Bernard, MS101, 3:00 Fri

Mourrain, Bernard, MS101, 4:00 Fri

Mukherjee, Sayan, MS27, 10:00 Tue

Mukherjee, Sayan, MS27, 10:00 Tue

Mukherjee, Sayan, MS37, 3:00 Tue

Murrugarra, David, MS31, 10:00 Tue

Murrugarra, David, MS31, 10:00 Tue

Murrugarra, David, MS41, 3:00 Tue

N

Nagel, Uwe, MS106, 4:30 Fri

Nanda, Vidit, MS74, 10:00 Thu

Nara, Takaaki, MS15, 3:30 Mon

Nash, Evan, PP1, 5:00 Mon

Navasca, Carmeliza, MS29, 10:30 Tue

Neches, Russell Y., MS16, 3:00 Mon

Nelson, Brad, MS37, 4:30 Tue

Nie, Jiawang, MS57, 3:00 Wed

Nødland, Bernt-Ivar U., MS82, 4:30 Thu

O

Obatake, Nida K., MS36, 3:30 Tue

Oeding, Luke, MS29, 10:00 Tue

Oeding, Luke, MS29, 11:30 Tue

Oeding, Luke, MS39, 3:00 Tue

Oeding, Luke, MS79, 4:00 Thu

Oneill, Christopher, MS70, 10:30 Thu

Oneto, Alessandro, MS46, 10:30 Wed

O'Sullivan, Michael E., MS86, 10:00 Fri

Ottaviani, Giorgio, MS25, 10:00 Tue

Ottaviani, Giorgio, MS46, 10:00 Wed

Owen, Megan, MS36, 3:00 Tue

Owen, Megan, MS36, 3:00 Tue

Owen, Megan, MS47, 10:00 Wed

Owen, Megan, MS58, 3:00 Wed

P

Pancaldi, Francesco, MS91, 10:30 Fri

Panizzut, Marta, MS73, 10:00 Thu

Pantea, Casian, MS83, 4:00 Thu

Pantone, Jay, MS30, 11:30 Tue

Pasley, Lillian F., MS98, 4:30 Fri

Pataki, Gabor, MS65, 10:30 Thu

Pegel, Christoph, MS19, 3:00 Mon

Perea, Jose, MS52, 10:00 Wed

Perea, Jose, MS63, 3:00 Wed

Perea, Jose, MS74, 10:00 Thu

Perrucci, Daniel, MS23, 10:00 Tue

Persichetti, Edoardo, MS1, 10:30 Mon

Peterson, Chris, MS40, 4:00 Tue

Petrovic, Sonja, MS100, 3:00 Fri

Petzoldt, Albrecht R., MS21, 11:00 Tue

Piene, Ragni, IP3, 8:30 Tue

Piene, Ragni, MS82, 3:00 Thu

Pir, Ata F., MS40, 4:30 Tue

Plaumann, Daniel, MS13, 4:30 Mon

Plaumann, Daniel, MS65, 10:00 Thu

Plaumann, Daniel, MS76, 3:00 Thu

Plaumann, Daniel, MS87, 10:00 Fri

Plaumann, Daniel, MS98, 3:00 Fri

Pogudin, Gleb, MS107, 4:30 Fri

Pontil, Massimiliano, MS68, 11:00 Thu

Poznanovi'{c}, Svetlana, MS26, 11:00 Tue

Q

Qi, Yang, MS39, 4:30 Tue

R

Rahkooy, Hamid, MS4, 11:00 Mon

Rajchgot, Jenna, MS59, 4:00 Wed

Ravagnani, Alberto, MS64, 10:00 Thu

Ravagnani, Alberto, MS75, 3:00 Thu

Ravagnani, Alberto, MS75, 4:00 Thu

Ravagnani, Alberto, MS86, 10:00 Fri

Ravagnani, Alberto, MS97, 3:00 Fri

Raymond, Annie, MS32, 3:00 Tue

Regan, Margaret, MS44, 11:00 Wed

Ren, Yue, MS73, 10:30 Thu

Reznick, Bruce, MS90, 10:00 Fri

Riener, Cordian, MS24, 10:00 Tue

Riener, Cordian, MS23, 11:30 Tue

Riener, Cordian, MS34, 3:00 Tue

Riener, Cordian, MS90, 10:00 Fri

Riener, Cordian, MS90, 10:30 Fri

Riener, Cordian, MS101, 3:00 Fri

Robeva, Elina, MS35, 3:00 Tue

Robeva, Elina, MS46, 11:00 Wed

Robeva, Elina, MS57, 3:00 Wed

Robeva, Elina, MS68, 10:00 Thu

Robeva, Elina, MS79, 3:00 Thu

Robins, Sinai, MS24, 10:30 Tue

Robinson, Michael, MS63, 4:00 Wed

Rodriguez, Jose I., MS33, 3:30 Tue

Rodriguez, Jose, MS104, 3:00 Fri

Rodriguez, Jose I., MS104, 3:00 Fri

Rojas, J. Maurice, MS4, 10:30 Mon

Rosen, Zvi H., MS28, 11:30 Tue

Rosenthal, Joachim, MS75, 3:00 Thu

Rusinko, Joseph P., MS6, 10:00 Mon

Rusinko, Joseph P., MS6, 10:00 Mon

Rusinko, Joseph P., MS16, 3:00 Mon

Rusinko, Joseph P., MS26, 10:00 Tue

Rusinko, Joseph P., MS56, 3:00 Wed

S

Sadeghi Manesh, Amirhossein, MS72, 11:00 Thu

Saez, Meritxell, MS72, 10:30 Thu

Safey El Din, Mohab, MS13, 3:00 Mon

Safey El Din, Mohab, MS23, 10:00 Tue

Safey El Din, Mohab, MS93, 10:00 Fri

Sagraloff, Michael, MS96, 10:30 Fri

Samper, Jose, MS62, 4:00 Wed

Sazdanovic, Radmila, MS52, 11:30 Wed

Scheiderer, Claus, MS87, 10:30 Fri

Schoennenbeck, Sebastian, PP1, 5:00 Mon

Schost, Eric, MS13, 3:00 Mon

Schost, Eric, MS13, 3:00 Mon

Schost, Eric, MS23, 10:00 Tue

Schröcker, Hans-Peter, MS28, 10:30 Tue

Schröter, Benjamin, MS84, 4:30 Thu

Schwartz, Russell, MS56, 3:30 Wed

Schweinhart, Benjamin, MS27, 11:00 Tue

Seceleanu, Alexandra, MS106, 4:00 Fri

Seigal, Anna, PP1, 5:00 Mon

Seigal, Anna, MS35, 3:00 Tue

Seigal, Anna, MS47, 11:30 Wed

Seigal, Anna, MS57, 3:00 Wed

Seigal, Anna, MS68, 10:00 Thu

Seigal, Anna, MS79, 3:00 Thu

Sevilla, David, MS45, 10:00 Wed

Shekhtman, Boris, MS71, 11:00 Thu

Shen, Chen, MS47, 10:30 Wed

Shen, Liyong, MS92, 10:30 Fri

Sherman, Samantha, MS66, 10:00 Thu

Shiu, Anne, MS50, 10:00 Wed

Shiu, Anne, MS61, 3:00 Wed

Shiu, Anne, MS72, 10:00 Thu

Shiu, Anne, MS83, 3:00 Thu

Shiu, Anne, MS102, 3:00 Fri

Shokrieh, Farbod, MS51, 10:00 Wed

Shonkwiler, Clayton, MS26, 10:00 Tue

Sidman, Jessica, MS28, 10:00 Tue

Sidman, Jessica, MS38, 3:00 Tue

Sidman, Jessica, MS38, 3:00 Tue

Silverstein, Lily, MS100, 3:30 Fri

Simon, Steven, MS51, 10:30 Wed

Simone, Naldi, MS98, 3:30 Fri

Singer, Michael, MS10, 10:00 Mon

Singer, Michael, MS20, 3:00 Mon

Singer, Michael, MS30, 10:00 Tue

Sinn, Rainer, MS65, 11:30 Thu

Sitharam, Meera, MS28, 10:00 Tue

Sitharam, Meera, MS38, 3:00 Tue

Sizemore, Ann, MS52, 10:30 Wed

Smith, Benjamin, MS11, 4:00 Mon

Italicized names indicate session organizers

Smith, Gregory G., MS78, 3:00 Thu

Smith, Heather C., MS26, 11:30 Tue

Solus, Liam, MS48, 10:00 Wed

Solus, Liam, MS48, 10:00 Wed

Solus, Liam, MS59, 3:00 Wed

Sommars, Jeff, MS44, 10:30 Wed

Sorokina, Tatyana, MS49, 11:00 Wed

Sottile, Frank, MS3, 10:00 Mon

Sottile, Frank, MS3, 10:00 Mon

Sottile, Frank, MS22, 10:00 Tue

Sottile, Frank, MS49, 10:00 Wed

Sottile, Frank, MS49, 10:30 Wed

Sottile, Frank, MS60, 3:00 Wed

Sottile, Frank, MS71, 10:00 Thu

Sottile, Frank, MS99, 4:30 Fri

Spaenlehauer, Pierre-Jean, MS1, 10:00 Mon

Spaenlehauer, Pierre-Jean, MS11, 3:00 Mon

Spaenlehauer, Pierre-Jean, MS21, 10:00 Tue

St. John, Audrey, MS28, 10:00 Tue

Stanley, Caprice, PP1, 5:00 Mon

Stasi, Despina, MS81, 3:30 Thu

Stasi, Despina, MS100, 3:00 Fri

Stasi, Despina, MS100, 3:00 Fri

Stawiska-Friedland, Margaret, MS93, 10:30 Fri

Stefanou, Anastasios, MS74, 11:30 Thu

Stewart, Allen, MS81, 4:00 Thu

Stigler, Brandilyn, MS41, 4:30 Tue

Stiller, Peter F., MS60, 3:30 Wed

Straub, Armin, MS20, 4:00 Mon

Strawn, Nate, MS9, 10:00 Mon

Strawn, Nate, MS9, 10:00 Mon

Strawn, Nate, MS19, 3:00 Mon

Streinu, Ileana, MS94, 10:00 Fri

Streinu, Ileana, MS105, 3:00 Fri

Streinu, Ileana, MS105, 4:00 Fri

Sturmfels, Bernd, MS8, 11:30 Mon

Sullivant, Seth, MS7, 10:00 Mon

Sullivant, Seth, MS17, 3:00 Mon

Sullivant, Seth, MS58, 4:00 Wed

Sumner, Jeremy, MS69, 11:30 Thu

Swinarski, David, CP5, 10:30 Fri

Szanto, Agnes, MS24, 10:00 Tue

Szanto, Agnes, MS85, 3:00 Thu

Szanto, Agnes, MS85, 3:00 Thu

Szanto, Agnes, MS96, 10:00 Fri

Szanto, Agnes, MS107, 3:00 Fri

Szöllosi, Ferenc, MS9, 11:30 Mon

Szpirglas, Aviva, MS107, 3:30 Fri

T

Tang, Xiaoxiao, MS23, 10:30 Tue

Tavenas, Sebastien, MS23, 11:00 Tue

Telen, Simon, MS14, 4:30 Mon

Tenório, Wanderson, CP3, 4:30 Wed

Theobald, Thorsten, MS32, 3:00 Tue

Theobald, Thorsten, MS43, 10:00 Wed

Theobald, Thorsten, MS43, 11:00 Wed

Theobald, Thorsten, MS54, 3:00 Wed

Theran, Louis, MS28, 10:00 Tue

Theran, Louis, MS38, 3:00 Tue

Theran, Louis, MS38, 3:30 Tue

Thomas, Ashleigh, MS102, 4:00 Fri

Thomas, Rekha, MS8, 10:00 Mon

Thomas, Rekha, MS18, 3:00 Mon

Tohaneanu, Stefan, MS71, 10:30 Thu

Torres, Fernando, MS75, 4:30 Thu

Trager, Matthew, MS8, 10:00 Mon

Trager, Matthew, MS8, 10:00 Mon

Trager, Matthew, MS18, 3:00 Mon

Tralie, Chris, MS63, 4:30 Wed

Transtrum, Mark K., MS7, 10:30 Mon

Traves, Will, MS28, 11:00 Tue

Tsigaridas, Elias, MS4, 10:00 Mon

Tsigaridas, Elias, MS14, 3:00 Mon

Tsigaridas, Elias, MS45, 10:00 Wed

Tymoczko, Julianna, MS60, 4:00 Wed

U

Uhler, Caroline, IP7, 8:30 Thu

Uhler, Caroline, MS59, 3:00 Wed

Usevich, Konstantin, MS90, 11:30 Fri

V

Valdettaro, Marcelo A., MS107, 3:00 Fri

van Meter, Lucas, MS8, 11:00 Mon

Vannieuwenhoven, Nick, MS25, 10:00 Tue

Vannieuwenhoven, Nick, MS46, 10:00 Wed

Vannieuwenhoven, Nick, MS57, 3:30 Wed

Varilly Alvarado, Anthony, MS42, 10:00 Wed

Varilly Alvarado, Anthony, MS53, 3:00 Wed

Varilly Alvarado, Anthony, MS53, 3:30 Wed

Velasco, Mauricio, MS65, 11:00 Thu

Veliz-Cuba, Alan, MS41, 4:00 Tue

Ventura, Emanuele, MS58, 3:30 Wed

Vidal, Rene, MS29, 11:00 Tue

Villamizar, Nelly, MS49, 11:30 Wed

Vinnikov, Victor, MS87, 11:00 Fri

Vinzant, Cynthia, MS38, 4:30 Tue

Vinzant, Cynthia, MS65, 10:00 Thu

Vinzant, Cynthia, MS76, 3:00 Thu

Vinzant, Cynthia, MS87, 10:00 Fri

Vinzant, Cynthia, MS98, 3:00 Fri

Viray, Bianca, IP6, 1:30 Wed

W

Walch, Olivia, MS7, 11:00 Mon

Wang, Ronghua, MS20, 4:30 Mon

Wei, Guowei, MS63, 3:30 Wed

Weihs, Luca, MS70, 11:30 Thu

Wiebe, Amy, MS98, 3:00 Fri

Wilburne, Dane, MS100, 4:00 Fri

Williams, Robert L., MS56, 4:30 Wed

Wiuf, Carsten, MS61, 3:00 Wed

Woodroofe, Russ, MS62, 3:30 Wed

Wu, Wenyuan, MS99, 3:30 Fri

X

Xi, Jing, MS58, 4:30 Wed

Xu, Yibo, MS54, 4:30 Wed

Italicized names indicate session organizers

Y

Yang, Jay, MS78, 4:30 Thu

Yang, Zhihong, MS13, 4:00 Mon

Yap, Chee K., MS13, 3:30 Mon

Ye, Ke, MS35, 4:00 Tue

Yoshida, Ruriko, MS36, 3:00 Tue

Yoshida, Ruriko, MS47, 10:00 Wed

Yoshida, Ruriko, MS58, 3:00 Wed

Yoshida, Ruriko, MS70, 11:00 Thu

Youngs, Nora, MS102, 3:30 Fri

Yu, Josephine, MS59, 4:30 Wed

Yu, Josephine, MS73, 10:00 Thu

Yu, Josephine, MS84, 3:00 Thu

Yu, Polly, MS72, 11:30 Thu

Yu, Wei-Hsuan, MS9, 10:30 Mon

Z

Zanudo, Jorge, MS41, 3:30 Tue

Zeng, Zhonggang, MS33, 4:30 Tue

Zhang, Xu, MS36, 4:30 Tue

Zheng, Hailun, MS51, 11:00 Wed

Zhou, Yuan, CP5, 11:00 Fri

Ziegelmeier, Lori, MS74, 10:30 Thu

Italicized names indicate session organizers

Notes

AG17 Budget

Conference Budget
SIAM Conference on Applied Algebraic Geometry
July 31 - August 4, 2017
Georgia Institute of Technology
Atlanta, Georgia

Expected Paid Attendance 380

Revenue

Registration Income		$79,350.00
	Total	$79,350.00

Expenses

Printing		$3,367.00
Organizing Committee		$3,800.00
Invited Speakers		$15,000.00
Food and Beverage		$18,000.00
Equipment Rental/Telecommunication		$2,750.00
Advertising		$7,500.00
Conference Labor (including benefits)		$23,905.00
Other (supplies, staff travel, freight, misc.)		$2,970.00
Administrative		$7,779.00
Accounting/Distribution & Shipping		$4,252.00
Information Systems		$7,818.00
Customer Service		$2,929.00
Marketing		$4,521.00
Office Space (Building)		$2,988.00
Other SIAM Services		$3,114.00
	Total	$110,693.00

Net Conference Expense		-$31,343.00
Support Provided by SIAM		$31,343.00
		$0.00

Estimated Support for Travel Awards not included above:

Student and Early Career	32	$24,000.00

Georgia Institute of Technology

COURTYARD

ATRIUM

006   005

FIRST FLOOR

171 170 168

SECOND FLOOR

249   254

255

202   271 270 268
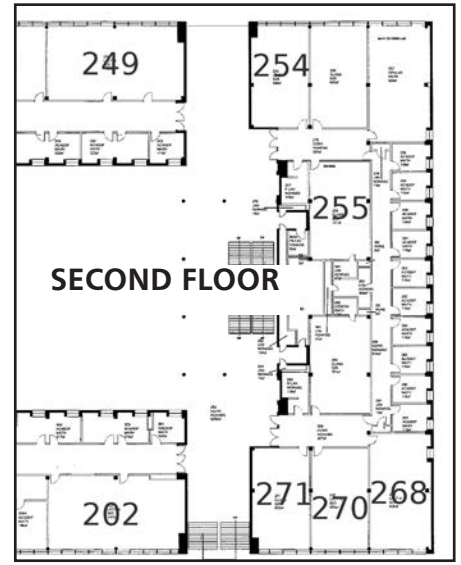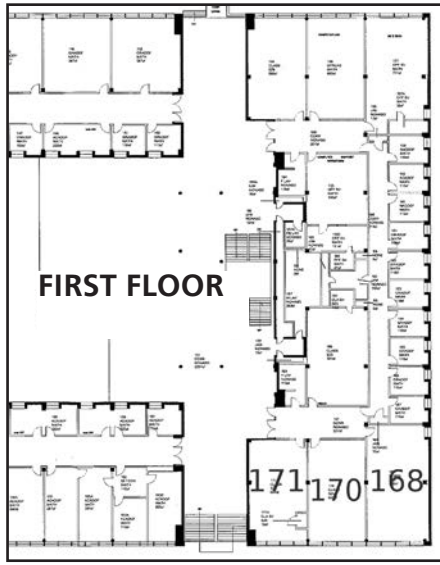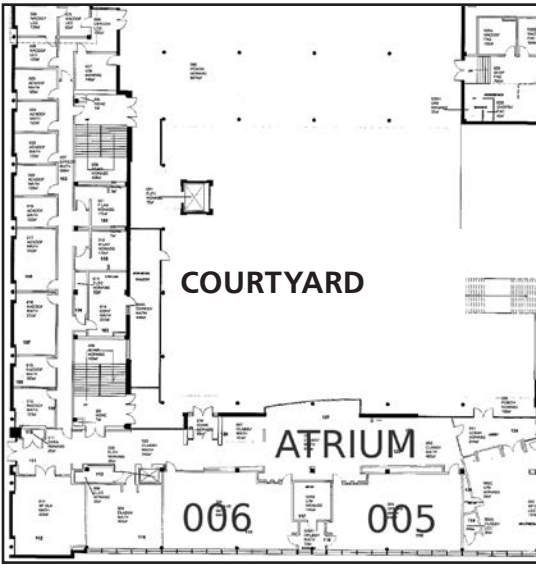
⭐ equals conference locations