



2019
MOVES
MATHEMATICS OF VARIOUS
ENTERTAINING SUBJECTS



Math Unfolded: the mathematical art of origami



**MOVES Conference events will be held
August 4 - 6, 2019 at the following locations:**
The National Museum of Mathematics, 11 East 26th Street
The Graduate Center, CUNY
5th Avenue between 34th and 35th Streets

MOVES Conference Schedule of Programs and Activities

Welcome researchers, educators,
and families to the 2019 MOVES Conference,
hosted by the National Museum of Mathematics!
MoMath is pleased to acknowledge MOVES sponsor



Sunday Afternoon

Math in the Park

Meet in *Additions*, the shop at MoMath
4:00-5:00

A Mathematical Walk in Madison Square Park (all ages)
Ron Lancaster, University of Toronto

Sunday Evening

Open House and Dessert Reception at MoMath

6:30

Museum open for conference attendees only;
early registration begins.

- Enjoy more than three dozen unique, hands-on MoMath exhibits without the crowds!
- Join Karl Schaffer as he leads attendees in hands-on string demonstrations to show surprising mathematical connections.
- Experience the amazing close-up magic of magician Mark Mitton and the mathematical magic of mathematician Colm Mulcahy.
- Learn to fold a crown, a modular flower, a fortune teller, and a surprise action model with OrigamiUSA.
- Don't miss the *Math Unfolded* exhibition in *Composite*, the gallery at MoMath, open all evening.

7:00

Dessert reception, Wafels & Dinges.

9:00

Reception ends.

Research Talks

MoMath is pleased to host
more than three dozen research talks
over the course of the conference.

*For the research track, follow the
blue listings in the program.*

Mathematical Activities

MoMath is happy to provide a change
of pace with more than three dozen
guided mathematical activities.

*For the activity track, follow the
yellow listings in the program.*

Monday Morning

Conference Kick-Off

Proshansky Auditorium, The Graduate Center, CUNY

- 8:30-9:15** Registration
- 9:15-9:35** Welcome and opening remarks
Cindy Lawrence, Executive Director and CEO
National Museum of Mathematics
Josh Laison, Willamette University
Robert W. Vallin, Lamar University
- 9:35-10:35** Opening keynote
From Flapping Birds to Space Telescopes: The Art and Science of Origami — Robert Lang

Proshansky Auditorium,
The Graduate Center, CUNY

- 10:45-** *A Guide to Some Literary*
11:10 *Logic Puzzles*
Jason Rosenhouse
James Madison University
- 11:20-** *Edgy Puzzles*
11:45 Karl Schaffer
De Anza College

The Graduate Center, CUNY, C202

- 10:45-** *Triangle Rotation in*
11:10 *Straight-strip Hexaflexagons*
Ann Schwartz
- 11:20-** *Mathematical Analysis of an*
11:45 *Origami Spring Structure*
Sophie Usherwood

The Graduate Center, CUNY, C203

- 10:45-** *Origami and Fashion:*
11:10 *A Common Thread*
Adrienne Sack
Madonna Yoder, MIT
- 11:20-** *Are there rules? Mathematical*
11:45 *Thinking Among Experts in Kolam*
Sunita Vatuk

The Graduate Center, CUNY, C204

- 10:45-** *The Devil's Calculator: Creating*
11:10 *a Math Puzzle for Lovers of Logic*
Christopher Jarvis
Cinq-Mars Media
- 11:20-** *Divide and Conquer Algorithm*
11:45 *for Algebra Game*
Pei-Duo Yu
City University of Hong Kong

The Graduate Center, CUNY, C205

- 10:45-** *21 or Broke: Blackjack and*
11:10 *the Stock Market*
Philip Dituri
FiCycle
- 11:20-** *Having Fun with Game Theory*
11:45 (all ages)
Elana Reiser
St. Joseph's College

The Graduate Center, CUNY, C197

- 10:45-** *First Lesson: Frog jumping*
11:10 *into a Box*
(all ages)
Jeanine Meyer
Purchase College
- 11:20-** *Pascal's Triangle and Origami*
11:45 (middle school and up)
Skona Brittain
SB Family School

Monday Morning (continued)

The Graduate Center, CUNY, C201

- 10:45-** *Tower of Hanoi*
11:10 (middle school and up)
Debbie Yuster
SUNY Maritime College
- 11:20-** *Domino Circles*
11:45 (all ages)
Lauren Rose
Bard College

Math in the Park

Meet in *Additions*, the shop at MoMath

- 10:45-** *A Mathematical Walk in*
11:45 *Madison Square Park* (all ages)
Ron Lancaster
University of Toronto
- 11:45-** *Sidewalk Math*
12:15 (all ages)
Brian Palacios
Bronx Center for Science
and Mathematics

12:10-1:25

Lunch, pre-ordered to eat with others onsite at CUNY
or on your own.

Monday Afternoon

Proshansky Auditorium,
The Graduate Center, CUNY

- 1:30-** *Color Swaps in Mosaic Knitting*
1:55 Susan Goldstine
St. Mary's College of Maryland
- 2:05-** *A Mathematician Knits*
2:30 *an Afghan*
Kim Roth
Juniata College
- 2:30-** Coffee Break/Problem Sharing
3:15
- 3:25-** *Recent Progress in Opt Art*
3:50 Robert Bosch
Oberlin College
- 4:00-** *Datamining Imaginary Maps*
4:25 Christopher Hanusa
Queens College, CUNY
Emily Garfield

The Graduate Center, CUNY, C202

- 1:30-** *An Origami-Inspired*
1:55 *Adventure in Number Theory*
and Limits
Jeanine Meyer
Purchase College
- 2:05-** *The Multi-Axial Coordinate*
2:30 *Notation for Pleat Intersection*
Analysis
Benjamin DiLeonardo-Parker;
Andrew Fisher, Central
Connecticut State University;
Matt Benet, Southern New
Hampshire University
- 2:30-** Coffee Break/Problem Sharing
3:15
- 3:25-** *Folding Functions: Origami*
3:50 *Corrugations from Equations*
Uyen Nguyen
WINWIN
- 4:00-** *A Hilbertian Completion for*
4:25 *the Origami Geometry*
Jorge Rubén Ruvalcaba Álvarez
National Autonomous
University of Mexico

MORE Monday afternoon
activities on next page.

Monday Afternoon (continued)

The Graduate Center, CUNY, C203

- 1:30-** *Which Dice Win At Chutes & Ladders, or "Chuteless & Ladderless"*
Stephen Lucas
James Madison University
- 2:05-** *Penney's Game with a Weighted Coin*
Robert Vallin
Lamar University
- 2:30-** Coffee Break/Problem Sharing
3:15
- 3:25-** *Counting Catan Configurations*
3:50 Brian Kronenthal, Kutztown University of Pennsylvania
- 4:00-** *Symmetric Circles in SET-Space*
4:25 Nathan Gaby
Berry College

The Graduate Center, CUNY, C204

- 1:30-** *Cubes Underscore Art: Alternative Solutions of the $n \times n \times n$ Rubik's Cube*
1:55 David Plaxco
Clayton State University
- 2:05-** *Automated Jigsaw Puzzle Solving*
2:30 Anar Amgalan
Stony Brook University
- 2:30-** Coffee Break/Problem Sharing
3:15
- 3:25-** *NP-Completeness of L Tetromino Tiling*
3:50 Walker Anderson
MIT

The Graduate Center, CUNY, C205

- 1:30-** *Polyhedral Paradise: Crafting Three Dimensional Models*
1:55 Asher Hurowitz
- 2:05-** *Amazing Geogami: Origami to Construct Geometric Figures*
2:30 Tom Walsh
Kean University
- 2:30-** Coffee Break/Problem Sharing
3:15
- 3:25-** *How to Unfold a Box into a Star: An Interactive Demo of the Star Unfolding of Boxes*
3:50 Yu Xuan Hong, Goldman Sachs
- 4:00-** *How Objects Can Trick You with Their Projections* (all ages)
4:25 Elena Yakubovskaya
Anar Amgalan
Stony Brook University

The Graduate Center, CUNY, C197 Activity Fair

- 1:30-** *Flexagon Fun*
3:30 (all ages)
Ann Schwartz
- 1:30-** *Discovering the Mysteries of Hexaflexagons and Flat Folded Origami* (middle school and up)
3:30 Sophie Usherwood
- 1:30-** *Hexaflexagon Secrets Revealed* (elementary and middle school)
3:30 Jim Propp
University of Massachusetts, Lowell
- 1:30-** *Hungry Birds*
3:30 Melissa Silk
University of Technology Sydney; Annette Mauer, STEAMpop

Monday Afternoon (continued)

The Graduate Center, CUNY, C198 Activity Fair

- 1:30-** *Modular Origami Unit for Polyhedra with Vertex Degree 4* (middle school and up)
3:30 Helena Verrill
Warwick University
- 1:30-** *Macroscopic Origami Voxel Engineered Structures* (all ages)
3:30 Jeannine Mosely
- 1:30-** *Make your own Kaleidocycle* (middle school and up)
3:30 Doris Schattschneider
Moravian College

MoMath, 11 E 26th St.

- 3:30-** *Da Vinci Dome group construction* (all ages)
5:00 Help build an impressive spanning structure using an ingenious and elegant system of specially notched wooden beams, inspired by the work of Leonardo da Vinci.

The Graduate Center, CUNY, C201 Activity Fair

- 1:30-** *Math Experiences* (middle school and up)
3:30 Sergio Belmonte
Museum of Mathematics of Catalonia
- 1:30-** *Math Games of Asia: JRMF in Hong Kong* (middle school and up)
3:30 Lin Ling
City University of Hong Kong
- 1:30-** *Math and Texas History* (all ages)
3:30 Lauren Siegel
MathHappens
John Goodwin
SkillMill
- 1:30-** *Drawing Traditional Patterns with Ruler and Compass*
3:30 Sarah Brewer
Alabama School of Math and Science

Monday Evening

- 5:15** Conference Dinner – The Graduate Center, CUNY - *Pre-registration required*

Proshansky Auditorium, The Graduate Center, CUNY

Monday Night MOVES

7:00 PM

Join us for an evening of mathematical entertainment, featuring a panel discussion with Robert Lang and Erik Demaine, movie clips, music, and an audience-participatory math dance!

All MOVES attendees are welcome to enjoy FREE admission to MoMath throughout the conference; please just show your badge in the retail shop, *Additions*, when you arrive.

Tuesday Morning

Proshansky Auditorium, The Graduate Center, CUNY

9:15-10:15 Keynote
Mathematics Meets Origami
Erik Demaine

10:15-10:45 Coffee Break

Proshansky Auditorium,
The Graduate Center, CUNY

10:45- *Padovan, Pascal, and Proofs Without Words*
11:10 David Nacin
William Paterson University

11:20- *PRIMES STEP Studies*
11:45 *Exploding Dots*
Tanya Khovanova
MIT

The Graduate Center, CUNY, C202

10:45- *Circle-Packing & Externally Tangent Circles in Origami*
11:10 Tovi Wen

11:20- *Origami Explorations of Convex Uniform Tilings Through the Lens of Ron Resch's Linear Flower*
11:45 Uyen Nguyen
WINWIN

The Graduate Center, CUNY, C203

10:45- *An Analysis of IQ-Link*
11:10 Donna Dietz
American University

11:20- *Lego Graphs*
11:45 Jonathan Needleman
Le Moyne College

The Graduate Center, CUNY, C205

10:45- *A Shuffle to Buffalo*
11:10 (middle school and up)
Ed Lamagna
University of Rhode Island

11:20- *Imagining the Fourth Dimension*
11:45 (all ages)
Barney Sperlin

The Graduate Center, CUNY, C197

10:45- *The Art of Folding Regular Polygons*
11:10 (middle school and up)
Kristal Webb
University of South Alabama

11:20- *Miura Sectors*
11:45 Melissa Silk, University of Technology Sydney; Lisa Giles; Annette Mauer, STEAMpop

The Graduate Center, CUNY, C201

10:45- *A Practical Workshop on Magic Squares*
11:10 Hossein Behforooz
Utica College

11:20- *Our Own Racing to the Edge of Knowledge*
11:45 Georgia Maragkou
1st High School of Skala Oropou, Greece

12:10-1:25 Lunch, on your own; see deals and discounts at back of program.

Tuesday Afternoon

Proshansky Auditorium,
The Graduate Center, CUNY

1:30- *The Wall of Fire Theorem*
1:55 Jim Propp
University of Massachusetts,
Lowell

2:05- *Journey into Space*
2:30 Peter Winkler
Dartmouth College

2:40- *Transforming and Realizing Polyhedra and Symmetrical Graphs*
3:05 Joseph Malkevitch
York College (CUNY)

The Graduate Center, CUNY, C202

1:30- *3D Printing Pre-Scored Origami Sheets*
1:55 Donald Plante
University of New Hampshire

2:05- *Extreme Sliceforms: Experiments in Scale, Material and Process*
2:30 Jenna Frye
The Maryland Institute College of Art
Mary Reisenwitz

2:40- *Folding Small/Unfolding Large: Exercises to Increase Understanding of Packing Large Equipment for Use In Space*
3:05 Charlene Morrow
Mount Holyoke College and OrigamiUSA

The Graduate Center, CUNY, C203

1:30- *Wait Wait Don't Tell Me*
1:55 Colm Mulcahy
Spelman College

2:05- *Whodunnit? A Magical Mystery with Cards*
2:30 John Harris
Furman University

The Graduate Center, CUNY, C204

1:30- *On a Mathematical Riddle by John Conway*
1:55 Wing Hong Tony Wong,
Kutztown University of Pennsylvania

2:05- *Enumeration of Payphone Permutations*
2:30 Max Alekseyev
George Washington University

2:40- *Sum Recurrences with Fibonacci and Other Linear Recurrence Sequences*
3:05 Ed Lamagna
University of Rhode Island

The Graduate Center, CUNY, C205

1:30- *Modular Origami for Math and Amusement*
1:55 (middle school and up)
Norma Boakes
Stockton University

2:05- *Folding a Simple Modular Origami Book and Three Theorems, Accessible to Children, Used in Designing It*
2:30 (middle school and up)
Rona Gurkewitz
Western Connecticut State University

2:40- *Origami Chinese Thread Book*
3:05 (all ages)
Paula Krieg

MORE Tuesday afternoon activities on next page.

Tuesday Afternoon (continued)

The Graduate Center, CUNY, C197 Activity Fair

- 1:30- 3:30** *Fold and Cut Challenge*
(all ages)
Nancy Blachman,
Julia Robinson Mathematics
Festival
Hector Rosario
- 1:30- 3:30** *Polyhedra on a Shoe String:
String and Finger Geometry*
(all ages)
Karl Schaffer
De Anza College
- 1:30- 3:30** *Birds of a Feather: Folding
Paper and Weaving Ribbon*
(middle school and up)
Suzanne Sumner
Marie Sheckels
University of Mary Washington
- 1:30- 3:30** *Turning Two Circles into a
Square Selfie Frame*
(all ages)
Rebecca Klemm
NumbersAlive!

The Graduate Center, CUNY, C198 Activity Fair

- 1:30- 3:30** *Persistence/Teamwork*
(middle school and up)
Bronna Butler, B. A. Baroque
Arts, LLC; Michael Ribick,
University of Missouri
- 1:30- 3:30** *PlayGAMI-Augmented Reality
Origami Creativity Platform*
(all ages)
Uttam Grandhi
I. Yosun Chang
Permute.xyz
- 1:30- 3:30** *Lumifold*
Melissa Silk
University of Technology
Sydney
Annette Mauer
STEAMpop

The Graduate Center, CUNY, C201 Activity Fair

- 1:30- 3:30** *24 — Sharpening Math Skills
with a Deck of Cards*
(all ages)
Linda Kwok
- 1:30- 3:30** *Equations: The Game of
Creative Mathematics*
Bob Coulter
Bek Handzik-Smith
Kei Handzik-Smith
- 1:30- 3:30** *“All You Need is Paper” Puzzles*
(all ages)
Yossi Elran
Davidson Institute of
Science Education
- 1:30- 3:30** *Origamics for all ages*
Keith Nabb
University of Wisconsin-
River Falls

Closing Remarks Proshansky Auditorium, The Graduate Center, CUNY

3:45 PM

Keep the magic
of math going
all year long!

Join

MO  MATH
today!

momath.org/join

The National Museum of Mathematics
wishes to thank the following
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Ron Lancaster, University of Toronto

Liz McMahon, Lafayette College

Tony Nance, Ohio State University

Kim Roth, Juniata College

Ron Taylor, Berry College

Post-MOVES event at MoMath:

Math Encounters:

**“The Wall of Fire Theorem:
A Story of Mathematical Discovery”**

with Jim Propp

Wednesday, August 7

4:00 pm and 7:00 pm

**Learn more and register at
mathencounters.org.**

**All are welcome; there is
no charge for this event.**



The National Museum of Mathematics is
America's only museum of math.
Its dynamic exhibits and exciting programs
highlight the wonder and beauty of
mathematics for visitors of all ages.

**Communications Award for
Public Outreach
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hidden museums
6sqft**

Eateries near CUNY

Show your MOVES badge to receive the following discounts:

Bedford & Co. - (two locations)

118 E. 40th St. btw Park & Lexington Aves. (inside Renwick Hotel)
- American restaurant - \$10 off

34 E. 32nd St. btw Park & Madison Aves. (inside HGU) - American restaurant - \$10 off

Bravo Kasher Pizza - 107 W. 37th St. btw 6th Ave. & Broadway - 20% off

Brickoven Pizza 33 - 489 3rd Ave. btw 33rd & 34th Sts. - free 16 oz. soda with purchase of two slices of pizza

Cask Bar & Kitchen - 167 E. 33rd St. btw Lexington & 3rd Aves. - American restaurant - 10% off in the dining room

Frankie Boy's Pizza - 1367 Broadway btw 36th & 37th Sts. - 20% off

Masala King - 64 E. 34th St. btw Park & Madison Ave. - Indian cuisine - 20% off lunch buffet

Slattery's Midtown Pub - 8 E. 36th St. btw 5th & Madison Aves. - Irish pub & sports bar - \$12 lunch special with complimentary drink (mixed drink/beer/wine) between 11:00 am - 3:00 pm, 20% off all food 3:00 pm - midnight

Eateries near MoMath

Show your MOVES badge to receive the following discounts:

Bourke Street Bakery - 15 E. 28th St. btw 5th & Madison Aves. - artisanal bakery - free iced coffee or iced tea with any sandwich purchase

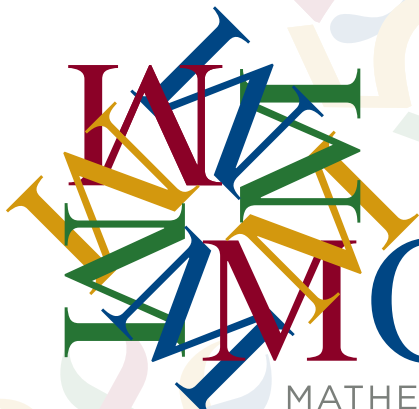
Mexicue - 225 5th Ave. btw 26th & 27th Sts. - Mexican restaurant & cocktails - 10% off

Tavern 29 - 47 E. 29th St. btw Madison & Park Aves. - American restaurant & craft beers - 10% off





Save the date!



**2021
MOVES**

MATHEMATICS OF VARIOUS
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moves.momath.org

August 8-10, 2021

