James Stuart Tanton

www.jamestantonmath.com

Education:

Ph. D.	Mathematics	Princeton	1994
M.A.	Mathematics	Princeton	1990
B. Sc (Hons.)	Mathematics	University of Adelaide	1988
B. Sc.	Mathematical Physics	University of Adelaide	1987

Employment and Professional Experience:

Berkeley School of Education
Associate Coordinator of Public Programs 2025 -present

Global Math Project 2015 -present
Leading Cofounder
A global movement to transform the world's perception of what mathematics can, and should be, using curriculum mathematics as a portal to joy, awe, deep understanding, and human connection. Currently 7.8 million students and teachers involved.

Descriptive video (https://youtu.be/Pmqw2e7A64Y)

Education Consultant 2012 - Present
K-16 student workshops, Professional Development for educators, curriculum writing and development work, invited lectures and special mathematics outreach presentations: national and international. (An average of 15 national and 15 international events each year.)

Online Courses:
Creating Radical Joy in your Mathematics Classroom. In Progress
Being created in conjunction with ASU's Mary Lou Fulton Teachers' College and the Global Math Project

Crash Course/ASU: Study Hall Algebra Spring 2020
Math advisor and video host for fifteen College Algebra support videos
https://www.youtube.com/user/crashcourse

Curriculum Creation: Spring 2024
Algebra 1 In Progress
Sole content creator and writer for SmartWithIt.com

Modern Algebra 2 module on "Periodicity"
Office of Superintendent of Public Instruction, Washington

Engage New York 2012
Advisor and designer for grade 9, 11, 12 curriculum creation

Social Media Presence:
YouTube Math Videos (Channels: James Tanton and DrJamesTanton)
Over 3.6 million views
𝕏 /Twitter (James Tanton) 33.6K followers

Synthesis School 2023 - 2024
Course Architect
AI Digital Tutor

Mathematical Association of America 2012 – 2014
Mathematician-in-Residence
Ambassadorial work, outreach.
Founded the *Curriculum Inspirations Project*
Still serving as their ***Mathematician-At-Large***

Muzology 2021- Present
Advisor
Curriculum mathematics music videos

Beagle Learning 2015 -present
Cofounder and Advisor
Bringing inquiry-based learning to scale to create a world of confident, team-oriented problem solvers willing and able to approach community and global problems of all scales.

Arizona State University Renewed each year since 2014
Adjunct Professor under School of Mathematical & Statistical Sciences

Common Core Inc./Great Minds 2013 – Present
Advisor and Consultant
K-12 mathematics curriculum for NY State. Advisor and consultant for grades 8-12. Consultant on extension to a national program.

Math for America (DC)
Teacher professional development 2012-2014

St. Mark's School 2004 – 2012
Full-time high school teacher

Founding Director St. Mark's Institute of Mathematics 2004 – 2012
Mathematics outreach: extracurricular middle-school and high-school student research classes; professional development and graduate courses for 7-12 mathematics teachers; public presentations, lectures and incidental workshops; mathematics publications and books; consulting.

Northeastern University School of Education
Adjunct Professor and Course Designer
2004 - 2012
Designer of the five graduate/teacher professional development core mathematics-content courses for their Masters of Education, Mathematics. (Offered in conjunction with the St. Mark's Institute of Mathematics.)

American University:
Adjunct Professor Spring 2012
Graduate Course for In-service Teachers

Milton Academy 2003 – 2004
Fulltime high school teacher

The Boston Math Circle
Co-director 2000 – 2003
Innovative Mathematics K-12

Harvard Extension School 2002 – 2003
Graduate courses / professional development courses.

Boston Public Schools 2002
Teacher Professional Development courses

Merrimack College
Associate Professor 1999 – 2000

St. Mary's College of Maryland
Assistant Professor 1995 –1999

New College of U.S.F.
Visiting Assistant Professor 1994 – 1995

Service:

OutSmartCollege 2025 - Present
Academic Advisor

National Museum of Mathematics 2012 - Present
Advisory Council (and past Chair)

Ibis Group (non-profit branch of **Great Minds** curriculum) 2020 - 2025
Board member

St. Mark's School 2013 - 2016
Trustee

Harvard Extension School: Math for Teaching Program 2008 - Present
Advisory Board

SIGMAA MCST 2007 - 2014
Special Interest Group of the MAA (Math Circles for Students and Teachers)
Cofounder, Chair and Executive Officer

The Math Teachers' Circle Network 2010 - Present
Advisory Board

The Proof School 2017 - Present
Advisory Board

Julia Robinson Math Festival 2017 - Present
Advisory Board

MathLy 2018 - Present
Advisory Board

Math Pickle 2018 - Present
Advisory Board

St. Mark's School 2013 - 2016
Trustee

AMS Math Circles Library 2010 - 2016
Editorial Board

Journal of Math Circles 2010 - 2017
Editorial Board

Anneli Lax New Mathematical Library (MAA) 2009 - 2015
Editorial Board

The National Association of Math Circles 2008 - 2012
Advisory Board

Awards:

President's Award for Innovation (ASU Study Hall, College Algebra) 2021

Joint Policy Board of Mathematics Communication Award 2020

MathMovesU Math Hero Award sponsored by Raytheon Company 2010
For Mathematics middle and high school teaching

The Kidder Faculty Prize 2006
St. Mark's School: High school teaching award

Beckenback Book Prize: The Mathematical Association of America 2004
For "Solve This: Mathematical Activities for Students and Clubs"

Trevor Evans Award: The Mathematical Association of America 2002
Trevor Evans Award: The Mathematical Association of America 2001
Distinguished writing award.

Homer L. Dodge Award 1999
For college teaching excellence, St. Mary's College of Maryland.

Princeton University Engineering Council Teaching Award 1994
Teaching excellence.

George Murray Scholar 1988 – 1991
Australian award for academic achievement and progress.

Undergraduate Prizes: Pure Mathematics.
Amir Hasan Abdi Prize (1987); J. R. Wilton Prize (1986);
E. S. Barnes Prize (1986); J. H. Michael Prize (1985).

Select Recent Featured (keynote) Presentations:

DataMathLab, Romania
"Bringing Joy, Meaning, and Human Connection to the Traditional Curriculum"
June 2025

CosmoCaixa-Science Museum: Barcelona, Spain March 2025
Presentations and Workshops on "Computational Thinking"

Anderson Lecture: MAA LA/MS Sectional Meeting February 2025
"The State of College Algebra" and "The Bee Numbers"

Aditya Birla World Academy: Mumbai, India January 2025
"Infinity is Infinity is Infinity"

North Dakota Council of Teachers of Mathematics June 2024
"Answering all those thorny questions you secretly hope students won't ask."

New Mexico Mathematical Association of Two-Year Colleges April 2024
"Some surprises with the Fibonacci Numbers"

Aditya Birla World Academy, Mumbai Jan 2024
"The Hemachandra numbers"

CosmoCaixa-Science Museum: Barcelona, Spain Feb 2023
"Exploding Dots"

The Academy of Teachers, New York Feb 2022
Master Class: "Folding"

ST Math Leadership Symposium Jan 2022
"Making Math Human"

Mathematical Association of Victoria, MAV20 Conference Dec 2020
"Exploding Dots: A global phenomenon" Focus primary school mathematics
"Exploding Dots: A global phenomenon" Focus secondary school mathematics

AMATYC National Meeting Nov 2019
"A Dozen Proofs that 1 = 2: A misguided review of mathematics"

Alberta Teachers' Association Province Meeting Oct 2019
"Making Curriculum Mathematics a Mathematics High"

Australian Association of Mathematics Teachers National Meeting July 2019
"How to Think Brilliantly and Creatively in Mathematics:
A Few Modest Thoughts."

Books:

De-Cluttering Mathematics: 5 Fundamental Understandings that Unleash Meaningful Student Thinkng (Grades 6 – 12)
Coauthored with Ted Coe, April Strom, Scott Adamson
Under Contract TCPress

The WHY of Mathematics:
Answering Big Questions about Numbers and their Arithmetic.
CORWIN 2026

How Round is a Cube? And Other Mathematical Ponderings.
American Mathematical Society 2019

Functions and their Graphs: A Clever Study Guide.
Mathematical Association of America 2018

The Power of Mathematical Visualization:
DVD course and textbook. The Teaching Company, 2016

The Zen Master's Collection: Relations and Equations. Edfinity. 2016

The Zen Master's Collection: 8 Tips to Conquer Any Problem. Edfinity. 2016

The Zen Master's Collection: Counting and Probability. Edfinity. 2016

The Zen Master's Collection: Numbers and the Number System. Edfinity. 2016

The Zen Master's Collection: Logical Reasoning. Edfinity. 2016

Avoid Hard Work: And other encouraging mathematical problem-solving tips for the young, the very young, and the young at heart.
Co-authored with Maria Droujkova, Yelena McManaman, Natural Math 2015.

Without Words: Tarquin. 2015

Without Words II: Tarquin. 2015

Trigonometry: A Clever Study Guide. MAA. 2015

Geometry: An Interactive Journey to Mastery.
DVD course and textbook. The Teaching Company. 2014

Mathematics Galore: The First Five Years of the St. Mark's Institute of Mathematics
MAA 2012

The Encyclopedia of Mathematics
Facts on File 2005

Solve This: Mathematical Activities for Students and Clubs.
MAA. 2001
Translated into Spanish, Real Sociedad Matemática Española 2018

Self-published
Written 2006 – 2012. Approximately 10,500 sales to date.

THINKING MATHEMATICS!:
Volume 1: Arithmetic = Gateway to All
Volume 2: Advanced Counting and Advanced Algebra Systems
Volume 3: Lines, Circles, Trigonometry and Conics
Volume 4: Functions and their Graphs
Volume 5: e, i, pi and all that!
Volume 6: Calculus
Volume 7: More Calculus
Volume 8: Probability and Statistics

GEOMETRY: Volume 1 and Volume 2

MATHEMATICAL THINKING: Numbers and their Algebra
(An advanced course for middle-school students and their teachers.)

Weird Ways to Work with Pi

Book Chapters

"James" in *COVIDiary of Mathematicians.*(Mathematical Society of Archimedes, Belgrade, 2021)

"The Global Math Project: Uplifting mathematics for all" in *Mathematical Outreach: Explorations in Social Justice Around the Globe.* (World Scientific, 2020)

"How to fold a tie into sevenths" in *Inspiring Mathematics: Lessons from the Navajo Nation Math Circles.* (AMS, 2019)

Sample International Workshops and Invited Talks:

"How to Fold Things into Thirds"
Mumbai, 2020.

"The Fabric of Math": Co-presented with Jennifer Wathal, Karim Letwinsky
Hong Kong, 2019

"Exploding Dots"
Spain, Tanzania, Serbia, Malaysia, India, Canada, Australia, Panama, Hong Kong, Vietnam, Thailand, Philippines, Brunei: 2016-Present

"How Many Degrees are in a Martian Circle? And other human – and non-human – questions one should ask."
India, Serbia, Panama, Australia: 2016, 2017, 2018, 2019

"The Area Model," "Mathematical Visualization"
UAE, Philippines, Australia, India: 2017, 2018, 2019

"Dyadic Fractions, Folding, and Dragons" (and a suite of 11 additional lectures)
CPN, Belgrade, Serbia, 2016
American School in Japan

American School in Dubai
Various Workshops
February, 2015

MATRIX workshop
"The Global Math Project"
Leeds, UK, September 2016

"A Dozen Proofs that 1 = 2: A misguided review of all of mathematics"
U.S., Germany, 2014, 2015, 2016, 2017, 2020.

EARCOS 2017
Curriculum-focused workshops for South East Asian International School educators.
Kota Kinabalu, Borneo, April 2017.

EARCOS 2014
Curriculum-focused workshops for South East Asian International School educators.
Bangkok, Thailand, March 2014

K-12 Unsolved Problems: Workshop
Co-organizer with Gordon Hamilton. Banff, BIRS, November 16 and 17, 2013
SUM conference, K-12 mathematics, Two Workshops: Saskatchewan; May 2012
"A Transition to Change"
CBM Workshop, London. November 2011

Korean International School, 9-12 mathematics, Seoul. December 2010

Velammal School Workshops; Eleven eight-hour workshops for educators covering the entire K-12 mathematics curriculum. Chennai, India. June 2007

Sample U.S. Presentations:

Numerous presentations and workshops at Math Circle groups, school events, colleges, and incidental conference and special events across the U.S. (Typically two or three per month.)

"Bee Numbers"
Stanford Math Teacher's Circle, 2026

"Are Complex Numbers Forced Upon Us?"
SFSU, 2025

"Exploding Dots," "The Power of Mathematical Visualization," "How Many Degrees are in a Martian Circle?" as above throughout North America. 2012,2017,2018, 2019, 2020, 2021, 2022, 2025, 2026

"Quadratics: How to teach the problem-solving mindset while teaching"
Tuscon, 2020 (and elsewhere).

"A Dozen Proofs that 1 equals 2"
Joint Mathematics Meetings, 2020

"Seriously … Why is Negative Times Negative Positive?"
Joint Mathematics Meetings, 2020.

"Fractions are Hard!"
Phoenix, 2019.

"Impossible Tangles"
National Museum of Mathematics, 2018

"Freaky Fixed Points"
MAA MathFest, 2018

"Jazz and Math" Quadrivium series with Marcus Miller and Mark Gross
National Museum of Mathematics, 2018

"Exploding Dots," "The Power of Mathematical Visualization," "How Many Degrees are in a Martian Circle?" as above throughout North America. 2012,2017,2018, 2019, 2020

"The Global Math Project: Exploding Dots"
Global Math Project Symposium, October 2017
New York University

"The Power of Visualization in Mathematics"
Texas Graduate Center, November 2017
New York University- Abu Dhabi, New York Campus, October 2017

"Course Correction: Is high school mathematics serving society?
Can it? Does it? Should it?"
Public debate with Andrew Hacker, *The Math Myth*.
The National Museum of Mathematics, May 2016

"How to Think Brilliantly and Creatively in Mathematics: A guide for faculty."
Phoenix area Community Colleges, 2016

"The Astounding Mathematics of Bicycle Tracks"
NCTM, San Francisco, 2016

"Fibonacci Surprises"
University of Oklahoma, 2016
University of San Francisco, 2015

"Weird Ways to Multiply"
JMM: Council of Outreach presentation, 2016

"A Little Thought about Dots and Dashes"
MOVES conference, 2015

"Freaky Fixed Points"
MoMath, 2015

"What made me a Mathematician"
US Science and Engineering "Nifty Fifty" presentation, 2013

"Laundry Math"
Math Encounters lecture, MoMath NY, 2013

"Weird Ways to Work with Pi"
MoMath, 2015
JMM Public Outreach, 2014
Gathering of the Minds in celebration of Martin Gardner, 2013
MAA Carriage House lecture, 2012
Various school presentations

"A Sampler of Successful Math Circle Topics"
Joint Mathematics Meetings, New Orleans, 2011

"Research Mathematics from the Perspective of a Third-Grader"
Brigham-Young University, October 2008

"Three Calculus Questions that do not require Calculus"
Association of Advanced Placement Mathematics Teachers, 2007

"Sums of Powers: A Historical Overview"
Indian Institute of Technology, Chennai, India, 2007

"Seeking Points of Intersection: High-School Curricula vs. Math Circle Goals"
Joint Mathematical Meetings, New Orleans, 2007

"Accessible, but surprisingly sophisticated, research projects,"
MAA sectional meeting, Charlottesville, VA. 2005

MSRI Conference on Math Circle and Olympiads. Panel discussions. 2004.

Johns Hopkins CTY Career Symposium: Panel discussion.
Boston University, Boston, 2003

"New Undergraduate Research Projects"
Brigham Young University, 2002

"The Math Circle"
Brigham Young University, 2002

"Problem Solving techniques, with emphasis on open-response MCAS questions."
BPS Wilson Workshop, 2001

"Creating Excitement in the Classroom and out through Problem Solving"
BPS Summer Institute: Northeastern University, MA August 2001.

"Layered tilings"
MAA sectional meeting, Haverill MA, 1999

"The Banach-Tarski paradox"
St. Mary's College of Maryland, 1998.

Articles:

Academic

"On the homology of general linear groups over field extensions."
Thesis, Princeton University (1994).

"A homological fibration for Gl."
Journal of Algebra, **190** (1997), 540 – 555.

"π is the minimum value of pi."Co-authored with C. Adler.
College Mathematics Journal, **31** no. 2 (2000), 102 – 106.

"Fibonacci numbers, generating sets and the hexagonal property."
The Fibonacci Quarterly **38** (2000), 299 – 309.

"Introducing binary and ternary expansions via weighings." *College Mathematics Journal*, **33** no. 4 (2002), 17 – 18.

"Candy sharing." Co-authored with G. Iba.
The American Mathematical MONTHLY. **110**, no. 1 (2003), 25 – 35.

"The Hairy Ball Theorem via Sperner's Lemma." Co-authored with Tyler Jarvis.
American Mathematical MONTHLY. **111**, no. 7 (2004), 599 – 603.

Pedagogical

"Proportional Relationships Decluttered – at last!"
NWEP White Paper (2022)
Co-Authored with Ted Coe, April Strom, Kyle Pearce

"How to Think Brilliantly and Creatively in Mathematics: A Few Modest Thoughts. Australian Mathematics Education Journal, Vo1, Issue 3 (2019).

"The Global Math Project: Uplifting Mathematics for All"
Book chapter in *MATHEMATICAL OUTREACH: Explorations in Social Justice Around the Globe.* (Ed: Hector Rosario) World Scientific Publishing, 2019.

"Hello! My name is …" *Oncore AATM Journal*, Fall 2017, 50-60.

"Teaching Tip: An Introduction to e^ix without series." *College Mathematics Journal*, **39**, no. 1, (2008), 23.

"Pit Your Wits Against Young Minds!" *Mathematical Intelligencer*, **29**, no. 3, (2007), 55-59.

"Math Circles and Olympiads. MSRI asks: Is the US Coming of Age?"
NOTICES **53** no. 2 (2006), 200-205.

"Les Cercles de math et les Olympiades." *Mathématique et Pédagogie* **159** (2006), 27-39. *Translated by* Charlotte Bouckaert.

Proof Without Words

"Proof without words" *College Mathematics Journal* **40** no. 2 (2009), 86.

"Proof Without Words." *College Mathematics Journal* **39** no. 2 (2008), 106.

"Proof Without Words" Co-authored with participants of the Northeastern University Geometry course, *College Mathematics Journal* 2006.

"Mathematics Without Words." *College Mathematics Journal*. **34**, no. 1 (2003), 14.

"Proof Without Words." *Math Magazine* **74** no. 4 (2001), 313.

Co-Authored with K-12 students:

"Tilings, Order Partitions and Weird Languages" co-authored with St. Mark's Institute of Mathematics students. *FOCUS*, **32**, no. 3 (2012), 16-17.

"Pick's Theorem – and Beyond!" co-authored with St. Mark's Institute of Mathematics students, *FOCUS*, **30**, no. 1 (2010), 14-35.

"Young Students Explore Proofs Without Words," co-authored with St. Mark's Institute of Mathematics students, *FOCUS*, **29**, no. 5 (2009), 10-11.

"Lattice Polygons for Mathematicians and for Engineers." *College Mathematics Journal*, **40**, no. 5, (2009), 336, 360,369, 375. (Part 1 co-authored with high-school student N. Roumas.)

"An Intuitive Approach to the Borsuk-Ulam Theorem," co-authored with St. Mark's Institute of Mathematics students, *FOCUS*, **28**, no. 8 (2008), 14-15.

"Young students approach integer triangles."Co-authored with students of *The Math Circle. FOCUS*, **22**, no. 5 (2002), 4 – 6.

Expository: "An illuminating introduction to the Möbius function." *FOCUS*, **27**, no. 3 (2007), 16-17.

MATH HORIZONS

"A dozen questions about a donut." *Math Horizons,* November 1998, 26 – 31.

"A dozen reasons why 1 = 2."*Math Horizons,* February 1999, 21 – 25.

"A half-dozen activities to try with friends." *Math Horizons,* September 1999, 26 – 31.

"A dozen questions about squares and cubes." *Math Horizons,* February 2000, 26 – 31.

"A dozen areal maneuvers." *Math Horizons,* September 2000, 26 – 30, 34.

Also appears in *The Edge of the Universe*, MAA, 2006.

"A dozen questions about the powers of 2." *Math Horizons*, September 2001, 5 – 10.

Also appears in "Biscuits of Number Theory," Benjamin, A. and Brown, E. editors.

"A dozen questions about a triangle." *Math Horizons.* April 2002, 23 - 28.

Also appears in *The Edge of the Universe*, MAA, 2006.

"A dozen questions leading to the isoperimetric problem." *Math Horizons.* February 2003, 23 - 26.

"A dozen thoughts about sums of powers." *Math Horizons*. September 2003, 15 – 18.

"A dozen questions about pile splitting." *Math Horizons*. September, 2004, 28-31.

"A dozen questions about the Fibonacci numbers." *Math Horizons*. February 2005, 5-8.

Also appears in "Biscuits of Number Theory," Benjamin, A. and Brown, E. editors.

"A dozen questions about the triangular numbers" *Math Horizons.* November 2005, 5-8.

"A dozen questions about a dozen" *Math Horizons*. *Math Horizons.* April 2007, 12-15.

"A dozen questions about Pascal's Triangle." *Math Horizons*. November, 2008, 5-7, 27-30.

"A dozen hat problems." Co-authored with Ezra Brown. *Math Horizons*. April 2009, 22-25.

"A dozen harmonious problems" *Math Horizons*, April 2010, 25-30.

"A dozen elementary problems" *Math Horizons*, November 2011, 21-24.

"A dozen proofs that 0 = 1". *Math Horizons*, February 2012, 12-16.

Reviews:

"Mathematical Puzzles: A Connoisseur's Collection by Peter Winkler"
Read This! The MAA online book review column. August 2004

"Crossing the River with Dogs: Problem Solving for College Students"
Read This! The MAA online book review column. October 2004

Letter to the Editor, "Math Circles," *NOTICES*. March 2009.

"The Great Math Wrangle and Other News of SIGMAA MCST," co-authored the T. Shubin and S. Vandervelde. *FOCUS,* **30** No 1, (Feb/March 2010), 18