Let us know

The Fields Medalists, 2026



Debajit Kalita · Tezpur University · 19 November 2026

THE PRIZE

What is a Fields Medal?

1936

First awarded, from a trust left by Canadian mathematician J. C. Fields

< 40

Winners must be under forty

2–4

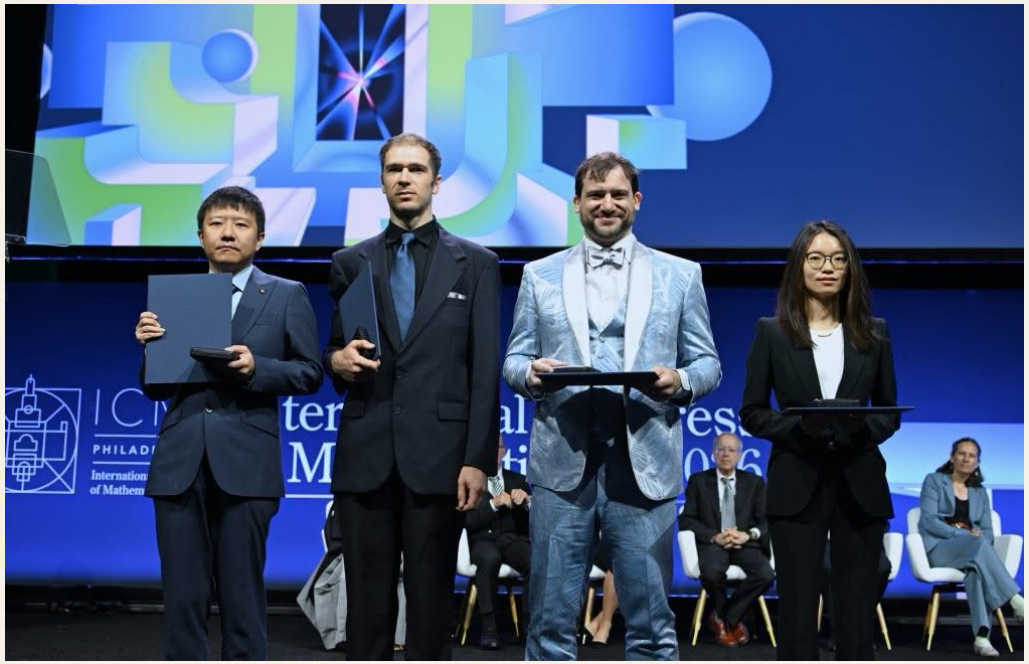
Medalists, once every four years, at the ICM



The gold medal shows Archimedes

Often called the “Nobel Prize of mathematics” due to its prestige.

ICM, Philadelphia, 23 July, 2026



THE CONGRESS

The International Congress of Mathematicians (ICM) meets every four years.

THIS TIME

Philadelphia, 23–30 July, 2026.

At the opening ceremony, the four winners of the 2026 Fields Medals were announced.

WHO WON

The Fields Medal 2026



John Pardon

Age

37

Professor at

Stony Brook University

PhD

Stanford University



Hong Wang

Age

35

Professor at

NYU Courant & IHES

PhD

MIT



Yu Deng

Age

37

Professor at

University of Chicago

PhD

Princeton University



Jacob Tsimerman

Age

38

Professor at

University of Toronto

PhD

Princeton University

Ages at the time of the award.

MEDALIST 1 OF 4



John Pardon

Professor at Stony Brook University

Works on geometry, topology, knot theory

Born 1989, North Carolina, USA

IN THE PRIZE COMMITTEE'S WORDS

"For his achievements in symplectic geometry including new approaches to virtual fundamental cycles, Fukaya categories of certain manifolds and counting holomorphic curves, and for his contributions to other areas of geometry and topology, including group actions on 3-manifolds and knot theory."

Quanta's profile: "The Quietest Mathematician Has Always Been Worth Listening To"

A quiet road to the top

International Olympiad in Informatics

Three-time gold medalist: 2005, 2006 and 2007.

Princeton, 2010

Still an undergraduate, he answers Gromov’s knot question.

Stanford, 2015

Completes his PhD with Yakov Eliashberg. His thesis makes him instantly famous in his field.

Princeton, 2016

Hired back as a full professor straight after his PhD.

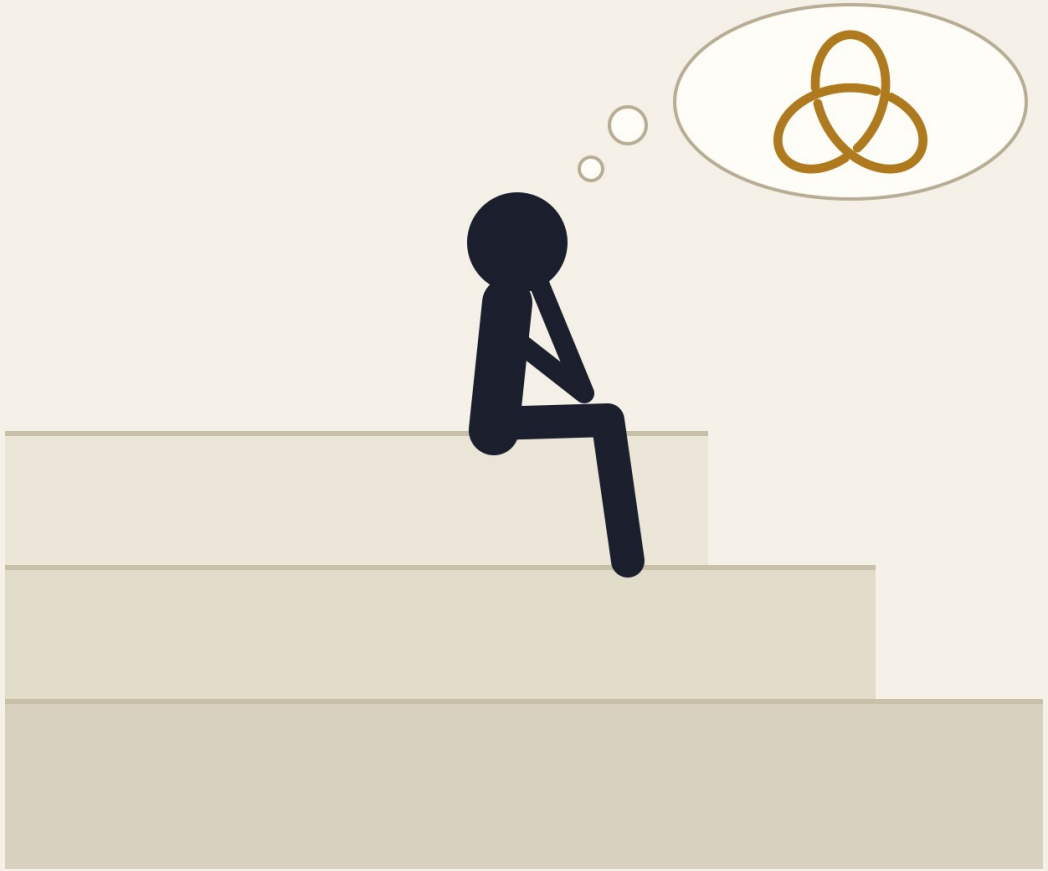
Stony Brook

Proves the MNOP conjecture in 2023.

OFF THE PAGE

- Fluent in Chinese: won a debate tournament in Singapore
- Wi-Fi passwords confuse him too

Lost in thought on the steps



As a PhD student at Stanford, Pardon was often seen sitting on the steps outside the maths building, **deep in thought**.

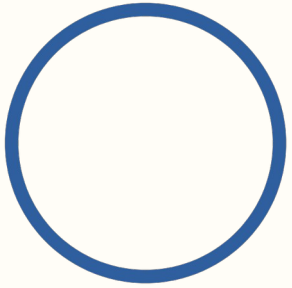
Say hello, and sometimes he would nod back. But…

“Sometimes he’d be deep in thought and wouldn’t know you’re there.”

— Ralph Cohen, Stanford mathematician

What is a knot?

Take a piece of string, tangle it, and **glue the ends together**. You may stretch, bend and wiggle it, but never cut it.



The unknot



The trefoil



The figure-eight

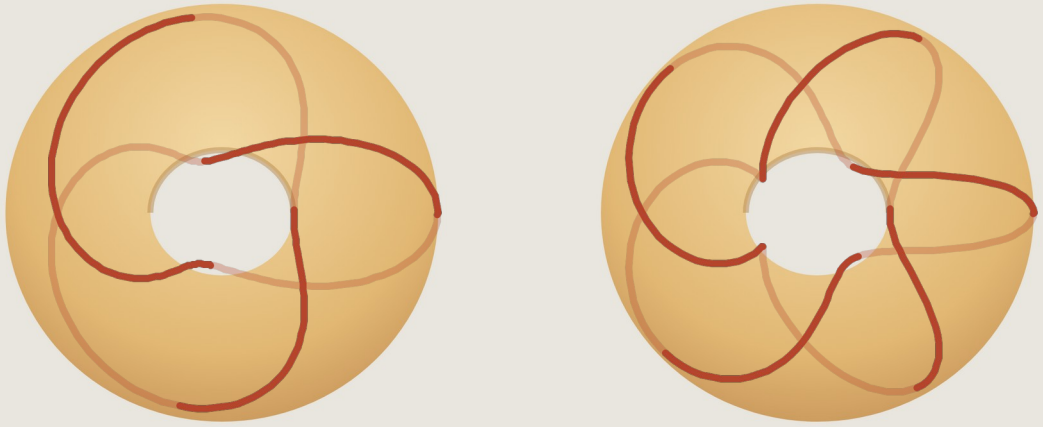


A torus knot

Gaps in each drawing show where the string passes underneath

JOHN PARDON · GROMOV'S QUESTION, 1983

Wrap the rope around a doughnut



3 times round

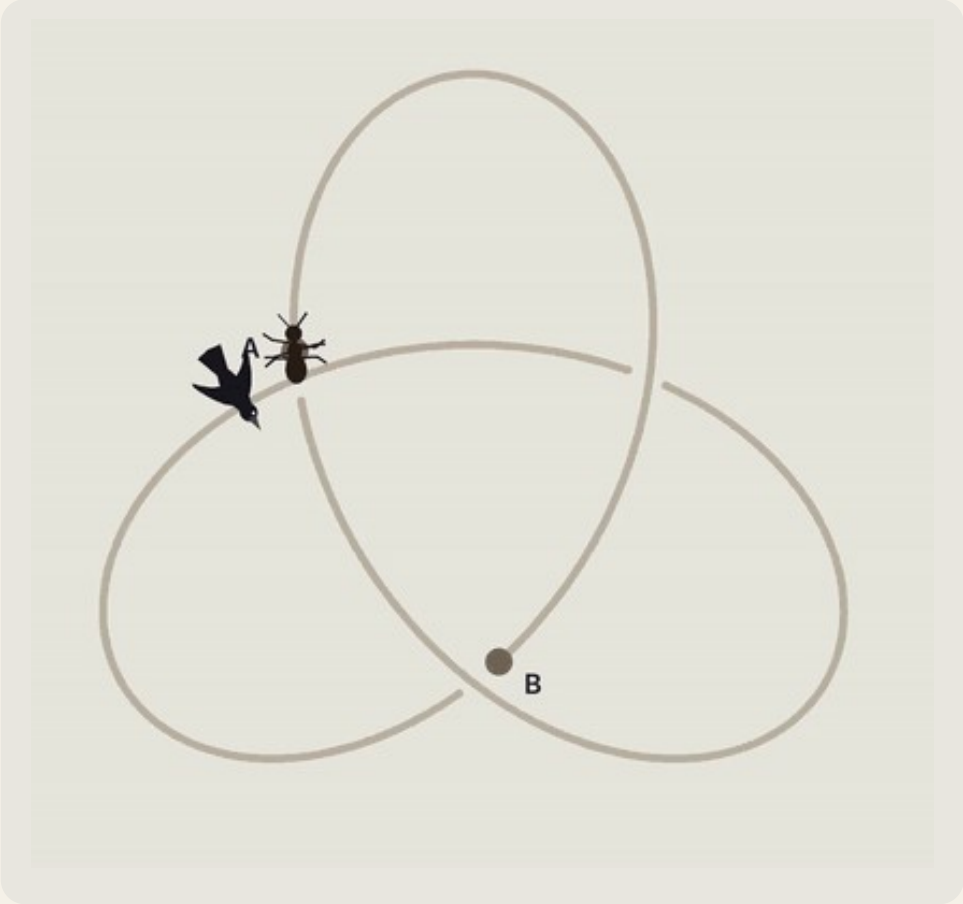
5 times round

Torus knots are drawn on the surface of a doughnut, which works like a mould. Take the doughnut away and the knot is left.

MIKHAIL GROMOV ASKED, 1983

As you wrap more and more times, can you always rearrange the knot so its distortion stays **below 100**?

What is a Distortion?



Pick two points on a knot and measure the distance between them in two ways.

The ant’s trip along the rope is never shorter than the crow’s shortcut through the air.

Find the pair of points where **ant ÷ crow** is biggest. That number is the knot’s **distortion**.

JOHN PARDON · THE ANSWER, 2010

An undergraduate walks into the office of David Gabai

“Well, I’ve proven such-and-such a theorem.”

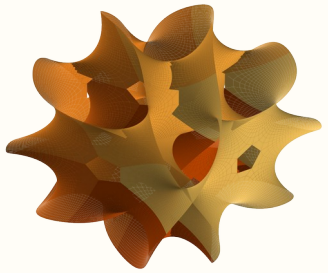
Pardon, still a Princeton undergraduate, to his professor David Gabai

The answer to Gromov’s question was No.

Some knots have distortion as large as you like, no matter how cleverly you rearrange them.

J. Pardon, *On the distortion of knots on embedded surfaces*, Annals of Mathematics 174 (2011), 637–646.

MNOP Conjecture



A Calabi–Yau shape (a slice)

STRING THEORY

Many versions of string theory predict that six extra dimensions are “curled up” into microscopic sizes, in the shape of **Calabi–Yau manifolds**.

TWO WAYS TO COUNT · 1980s & 1990s

Counting curves on these shapes reveals their structure. There are **two** different ways of counting: **Gromov–Witten** and **Donaldson–Thomas**.

2003 · MNOP CONJECTURE

Secretly the same?

Perhaps both counts come from **one hidden function**, just written out in two ways.

MNOP = Davesh Maulik, Nikita Nekrasov, Andrei Okounkov and Rahul Pandharipande, the four who proposed it

JOHN PARDON · 2023, TWENTY YEARS LATER

Pardon’s answer

THE MNOP CONJECTURE IS TRUE

The two ways of counting always agree.

HOW HE DID IT

He imported tools from an entirely separate area of maths and built a brand-new structure to bridge the gap: the **“Pardon algebra”**.

IN THE OFFICIAL CITATION

“a major breakthrough in the problem of comparing different methods that have been proposed to count curves in certain complex 3-folds”

MEDALIST 2 OF 4



Hong Wang

Professor at NYU Courant and IHES, France

Works on Harmonic Analysis, Geometric Measure Theory

Born 1991, Guilin, China

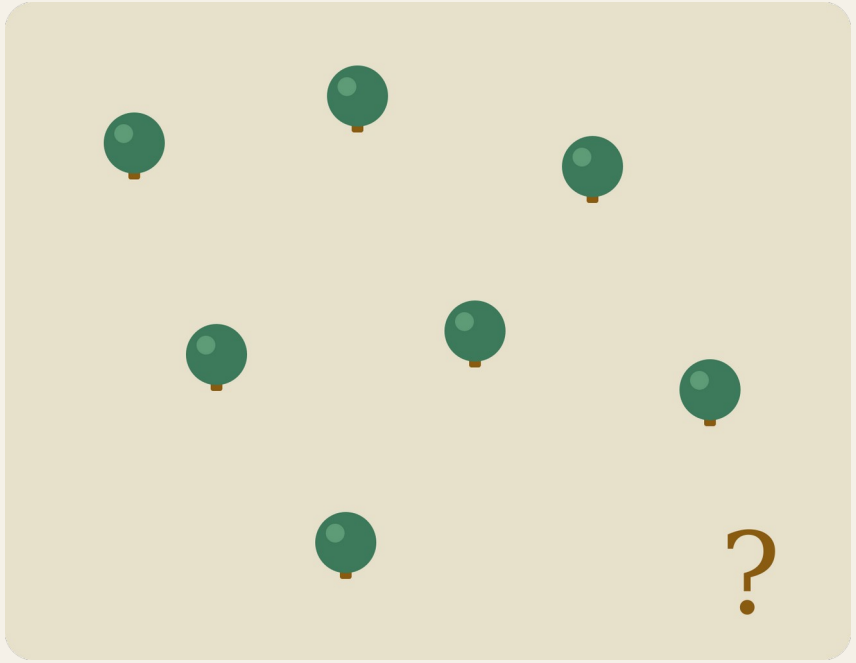
IN THE PRIZE COMMITTEE'S WORDS

"For her work in harmonic analysis and geometric measure theory, including applications of multiscale and decoupling techniques to the local smoothing conjecture for the planar wave equation, and major advances in Fourier restriction, Falconer distance sets, Furstenberg sets in the plane, and the Kakeya problem in three dimensions."

Known for: solving a 100-year-old puzzle about a spinning needle

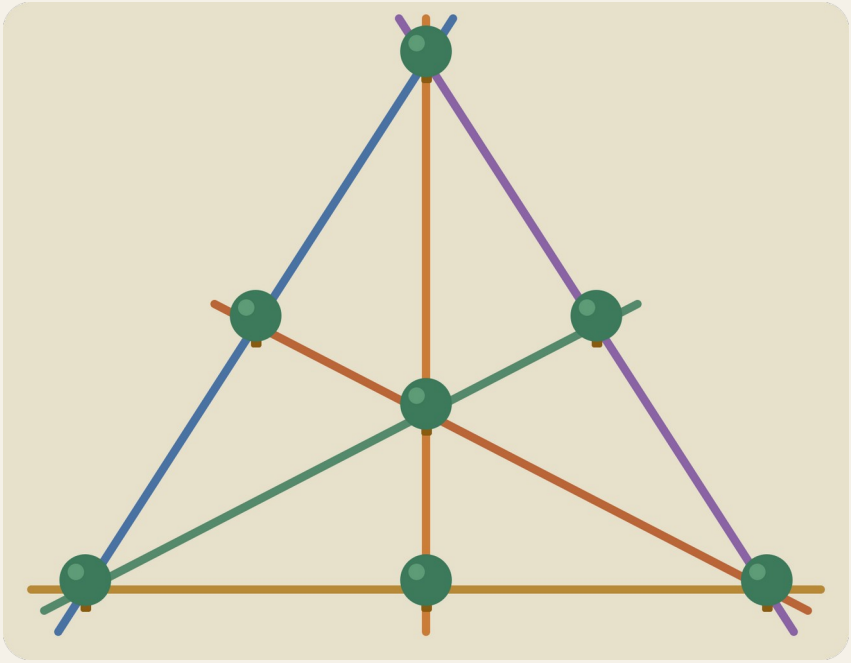
A puzzle she solved at age 6

THE PUZZLE



Plant **7 trees** so that as many **straight rows of 3** as possible line up.

HER ANSWER: 6 ROWS



A tree at each **corner**, at the **middle of each side**, and in the **centre**.

Hong Wang solved it faster than her father, a maths teacher.

A winding road to maths

Guilin

Grows up with teacher parents. Maths is one hobby among many.

Peking Univ.

Misses the single maths place for her province, starts in earth sciences, then switches to maths.

Paris, 2011

Studies at École Polytechnique, learning French. A short detour into architecture.

MIT, 2013–2019

A 2013 internship: Larry Guth's talk on the Erdős distinct distances problem draws her back to maths. PhD with him, 2019.

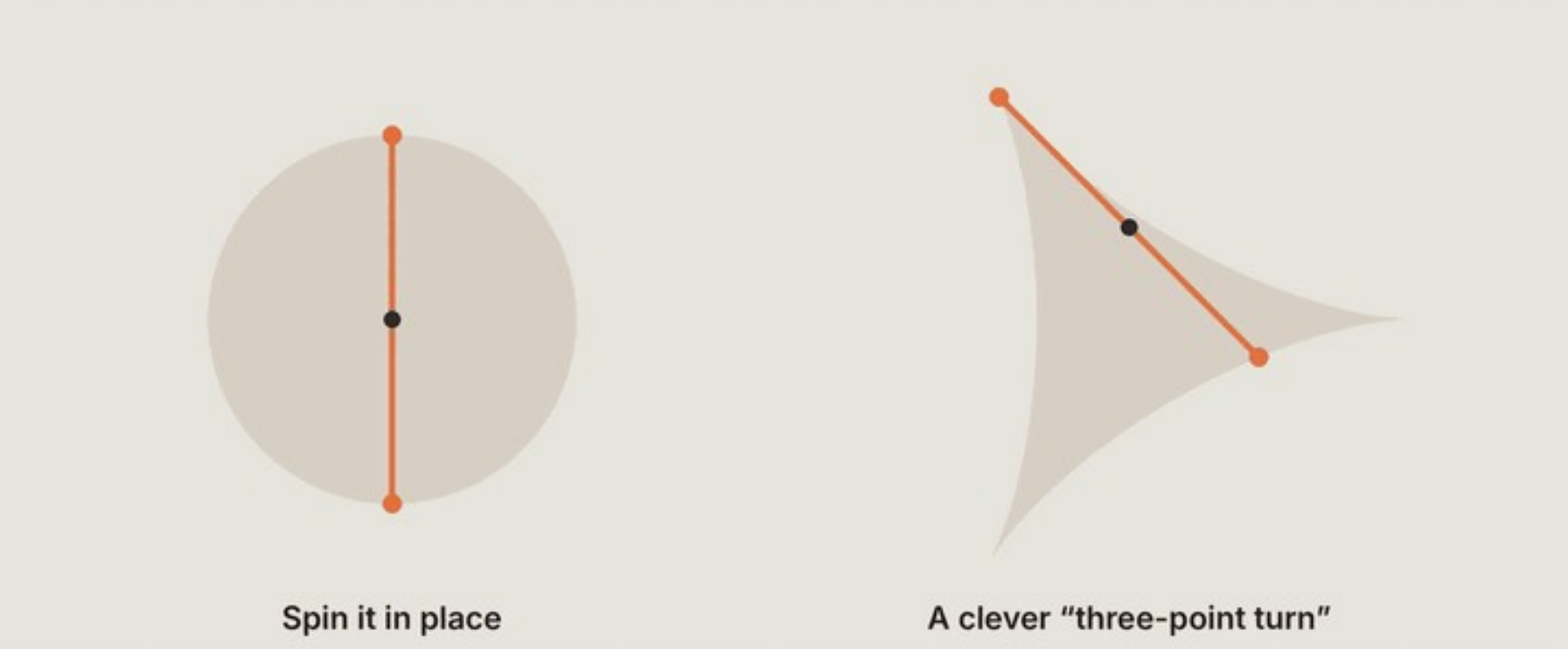
NYU & IHES

Professor at NYU Courant and IHES, France. In 2025, with Joshua Zahl, solves the Kakeya conjecture in 3D.

OFF THE PAGE

Clears her mind with early-morning walks

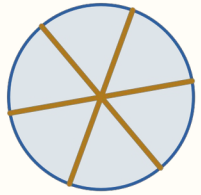
Turning a needle around



In 1917, Soichi Kakeya asked: **if you rotate a needle by 180 degrees, what is the smallest area it sweeps out?** In 1919 came a big surprise: Besicovitch showed the area can be made **as small as you like**.

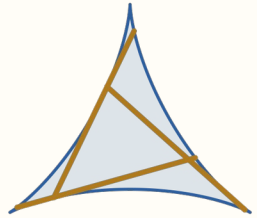
What is a Kakeya set?

Any set (shape) that contains a unit line segment (a needle of length 1) pointing in *every* direction.



A disc

Spin the needle about its middle.



A three-cornered shape

Kakeya's three-point turn.
Area: about 0.39, half the disc

The question is: how small could a Kakeya set be?

Areas are for a needle of length 1.

The Kakeya set conjecture

It states that any Kakeya set has **maximal dimension**.
In other words, a Kakeya set can have zero area or volume, yet it can never be “flat”: it always fills out *every* dimension of the space it lives in.

On a line

1-dimensional



In a flat plane

fully 2-dimensional



In space

fully 3-dimensional

HONG WANG · HER ANSWER

A 100-year-old puzzle, solved in 3D

In 2025, Hong Wang and Joshua Zahl proved that every Kakeya set in three-dimensional space **has dimension three**.

That is, even though such a set can have zero volume, it is never "flat".

Four years of work

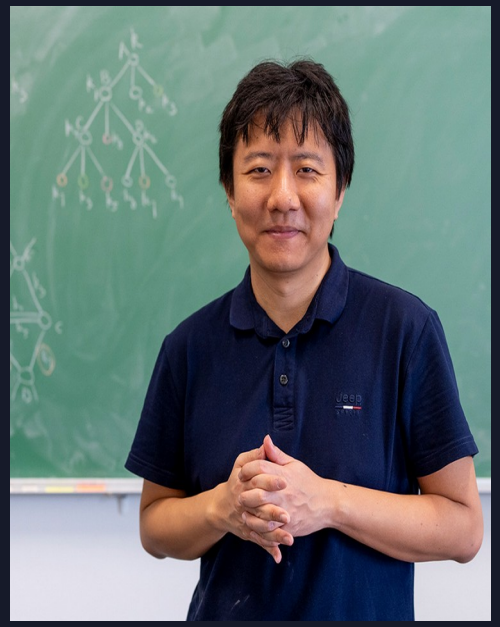
It began in the Covid years, with a blog post by Terence Tao. Wang and Joshua Zahl announced the proof in February 2025.

"Once in a century"

That is how some experts described the result.

H. Wang and J. Zahl, *Volume estimates for unions of convex sets, and the Kakeya set conjecture in three dimensions*, arXiv:2502.17655 (2025).

MEDALIST 3 OF 4



Yu Deng

Professor at the University of Chicago

Works on probabilistic theory of PDEs, wave turbulence and kinetic theory, statistical physics and quantum field theory, etc.

Born 1989, Shenzhen, China

IN THE PRIZE COMMITTEE'S WORDS

"For his work in partial differential equations, including the rigorous derivation of the Boltzmann equation from hard-sphere dynamics for rarefied gases, the derivation of wave kinetic equations from nonlinear dispersive systems, and probabilistic approaches to nonlinear Schrödinger dynamics."

Known for: explaining how gases behave, starting from single molecules

YU DENG · GROWING UP

The boy who read everything

A quiet child who read for hours. By **age 5 or 6** he was reading his mother's medical textbooks.

To get him outdoors, his parents took him on **walks along the beach**. The reward afterwards: he could read, or visit a bookstore.

If he misbehaved, *"the most effective punishment was to forbid him from reading"* — his mother

To save his eyes, his parents bought him a **Go** set. Soon he spent nearly all his free time on it.

YU DENG · HIS STORY

From the Go board to Hilbert’s sixth problem

Shenzhen

A bookworm who solves his father’s puzzle about tiling a grid at age 7.

Go, 2001

One win away from turning professional at Go. Loses three games in a row, and picks maths.

Olympiad

Fails the first round, then misses the team, then wins a gold medal in 2006.

Princeton PhD, 2015

PhD with Alexandru Ionescu, after moving from Peking University to MIT as an undergraduate.

University of Chicago

In 2024, with Hani and Ma, solves Hilbert’s sixth problem: Axiomatization of Physics.

OFF THE PAGE

- Writes Tang-style poetry
- Never learned to drive
- Still plays Go

YU DENG · THE PROBLEM THAT HOOKED HIM

The random data problem

THE QUESTION

PDEs describe how complex wave patterns change over time, from **water waves in the ocean** to **light waves in fibre-optic cables**.

NAHMOD'S GOAL

No matter how the waves look at the beginning, the PDE can **accurately model** what will happen to them **at any point in the future**.

THE CATCH

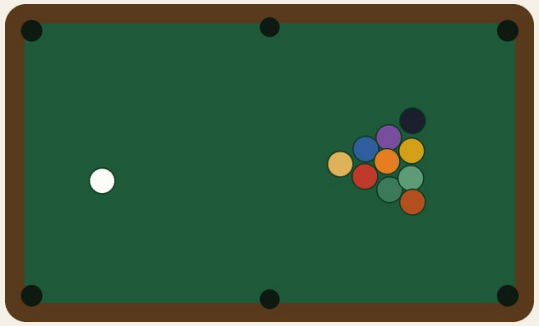
For most PDEs, proving that such a solution exists is **exceedingly hard**.

THE NEW IDEA

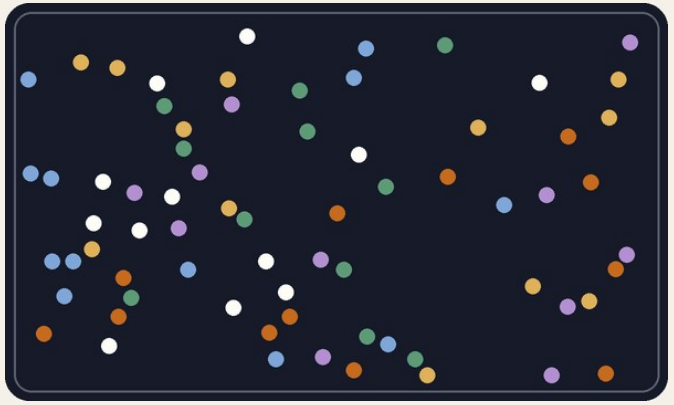
A random starting point brings **probability theory** into the deterministic world of PDEs.

"You are seeing your equation from a completely different point of view." — Yu Deng

From one billiard ball to a whole gas



↓ *× trillions*



1. Consider a billiard ball. It moves in a straight line, **collides** with other billiard balls, changes velocity, and keeps moving.

2. What if we have **trillions** of such tiny balls, constantly colliding? This is the **hard sphere model** of gases: the balls are the gas particles.

3. Tracking each particle is practically impossible. Instead, he looked at **statistical information**: the overall distribution of the particles, the average velocity, and so on.

4. All of this is captured in a single **density function**, governed by **Boltzmann's kinetic equation**.

Y. Deng, Z. Hani and X. Ma, *Long time derivation of Boltzmann equation from hard sphere dynamics*, Ann. of Math., to appear. arXiv:2408.07818

MEDALIST 4 OF 4



Jacob Tsimerman

Professor at the University of Toronto

Works on arithmetic geometry and complex algebraic geometry.

Born 1988, Kazan, Russia

IN THE PRIZE COMMITTEE'S WORDS

"For his contribution in the recasting of o-minimality as a fundamental method of arithmetic and complex algebraic geometry, and his role in the proof of many central conjectures including Griffiths' conjecture on the algebraicity of images of the period maps, and the André–Oort conjecture for Siegel modular varieties."

"A problem solver and also a theory builder of the very highest calibre." — Peter Sarnak

JACOB TSIMERMAN · HIS STORY

A born competitor



1 Early years

Born in Russia, raised in Israel, in Toronto from age 9. Solves his physicist grandfather's puzzles.

2 IMO, 2003–04

Gold at the age of 15, a perfect score at the age of 16.

3 Toronto, age 16

Leaves high school at 16 to study at the University of Toronto. Finishes his bachelor's degree at 18.

4 Princeton PhD, 2011

Studies with Peter Sarnak, who sets him on the André-Oort conjecture.

5 University of Toronto

Professor since 2014.
Proves André-Oort in full (2021).

OFF THE PAGE

Performs improv comedy

A 30-year journey since 1989

Let S be a Shimura variety, and let V be an irreducible algebraic subvariety of S. If the special points lying on V are Zariski-dense in V, then V is a special subvariety of S.

In other words: in a Shimura variety, if a shape contains infinitely many special points, it must itself be a special piece of that space.

1989

Yves André first states it, for curves.

1995

Frans Oort asks it for the space of **abelian varieties**.

ITS ROOTS

Grew out of work on **Fermat's Last Theorem**: special points instead of whole-number solutions.

2011

His PhD thesis

Builds the **key tool** and, with Pila, proves the **first case**.

2015

The key case

Proves **Oort's case**: the space of abelian varieties.

2021

Fully proved

With **Pila** and **Shankar**: for **all Shimura varieties**.

J. Tsimerman, *The André–Oort conjecture for A_g*, Annals of Mathematics 187 (2018), 379–390.

A medalist worried about AI

> Tsimerman believes AI will be better than mathematicians at doing maths within two years.

What he changed

He has stopped taking PhD students. He feels the work of a mathematician may change a lot in the coming years.

What worries him

For many mathematicians the joy is in solving problems. If that disappears, many may lose the wish to do maths at all.

THANK YOU

READ AND WATCH MORE

Quanta Magazine

2026 Fields Medal profiles of all four medalists

Plus Magazine

plus.maths.org · ICM 2026 interviews

IMU & Simons Foundation

IMU laudatios, and Simons Foundation videos on YouTube



All four medalists

Slides prepared with the help of Claude (Anthropic).

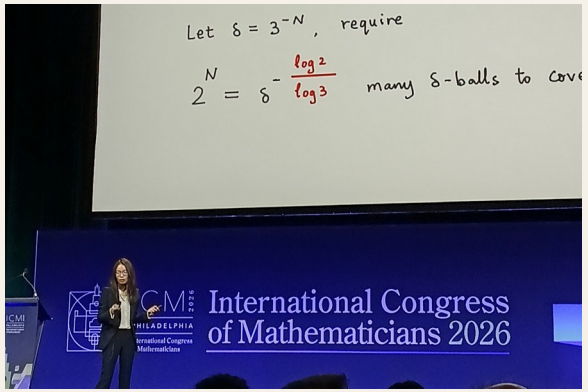
Some pictures



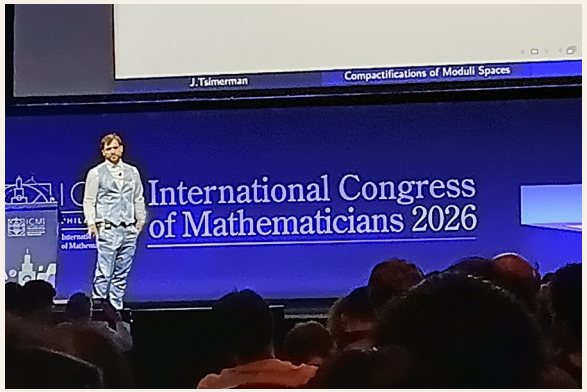
John Pardon at ICM 2026



A queue for questions after Pardon's lecture



Hong Wang during her lecture



Jacob Tsimerman during his lecture



Afterwards: a queue for questions