Applications of Mathematics

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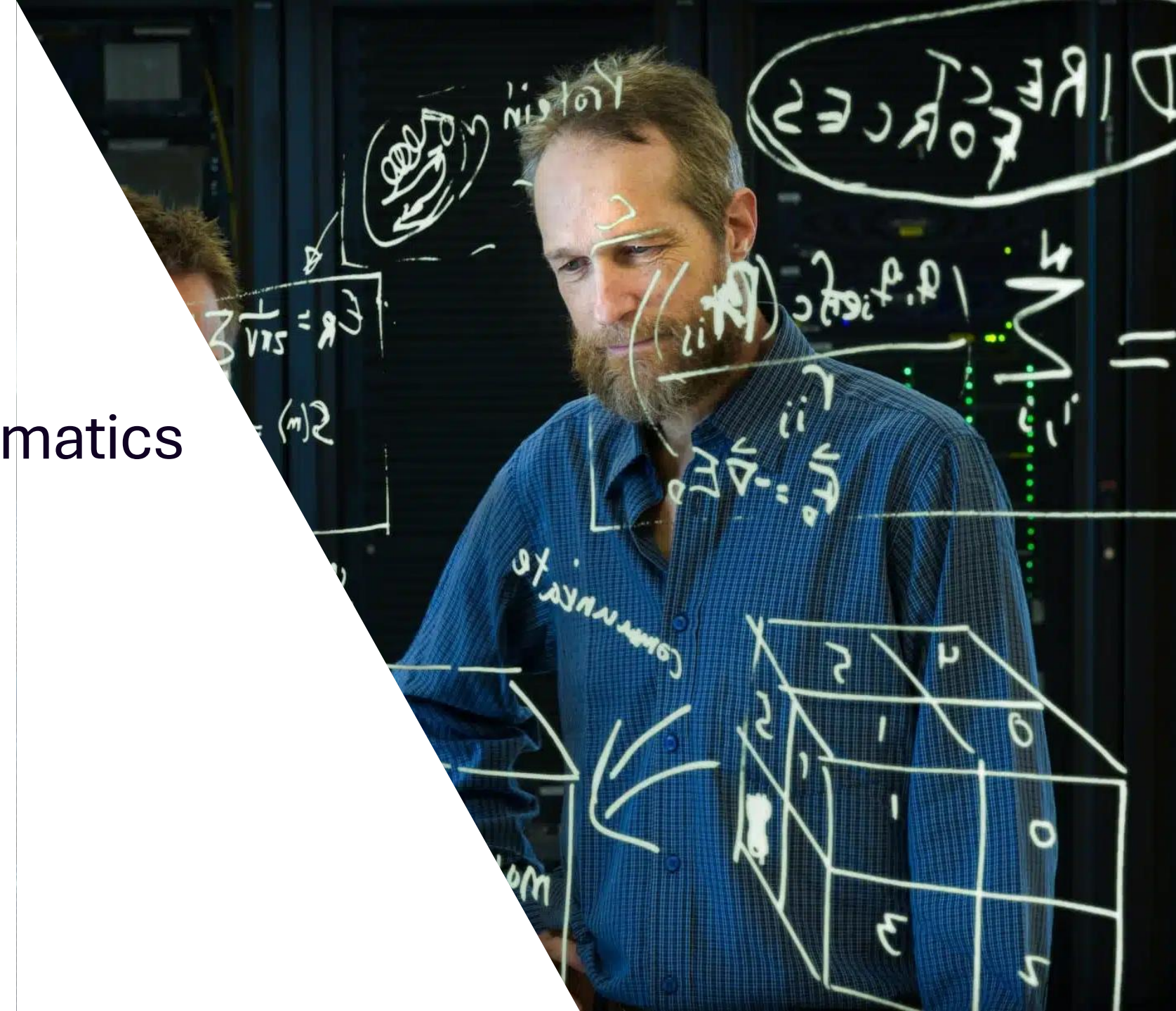
November 16th, 2024

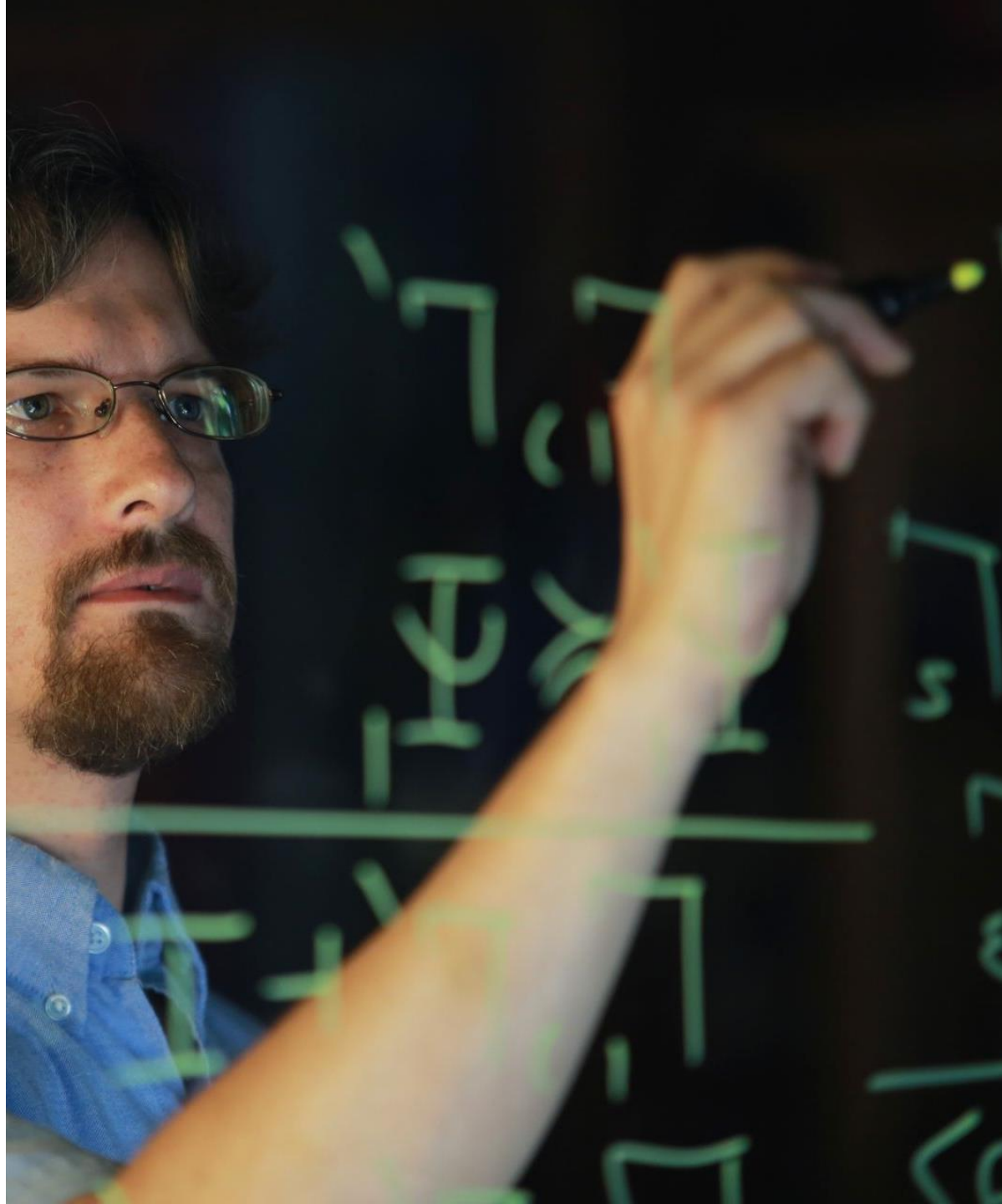


About Me.

1. My name is Agbo Dozie or… **‘Stardust’** for short
2. **Graduate of Applied Mathematics from the University of Benin** 👩🏾‍🎓
3. **Once worked on a model to predict football games using Math** 🧮
4. **I love music and poetry** 🎧
5. **I’d like to change the world, for good** 🚀
6. **Excited to be giving this talk** ☺

Outline

- What is Math About?
- Areas of Mathematics
- Applied Mathematics
- Great Mathematicians and their Works
- Let’s demonstrate Applied Mathematics
- Wanna start changing the world, using Math?
- Conclusions



What is Math? Math is more than equations and numbers… In 2010, I watched a TV show—Numb3rs, and it changed my entire view of Math

Hello Mathematics!

“Mathematics is the language with which God has written the Universe.”

- Galileo Galilei

Britannica defines it as: “Mathematics is the science of structure, order, and relation that deals with logical reasoning and quantitative calculation.”

What do all four pictures have in common?

The Golden Ratio!

The Pyramids of Giza

The Pathenons at Athens

1.618033988749…

Pine Cones

Our Milky Way Galaxy

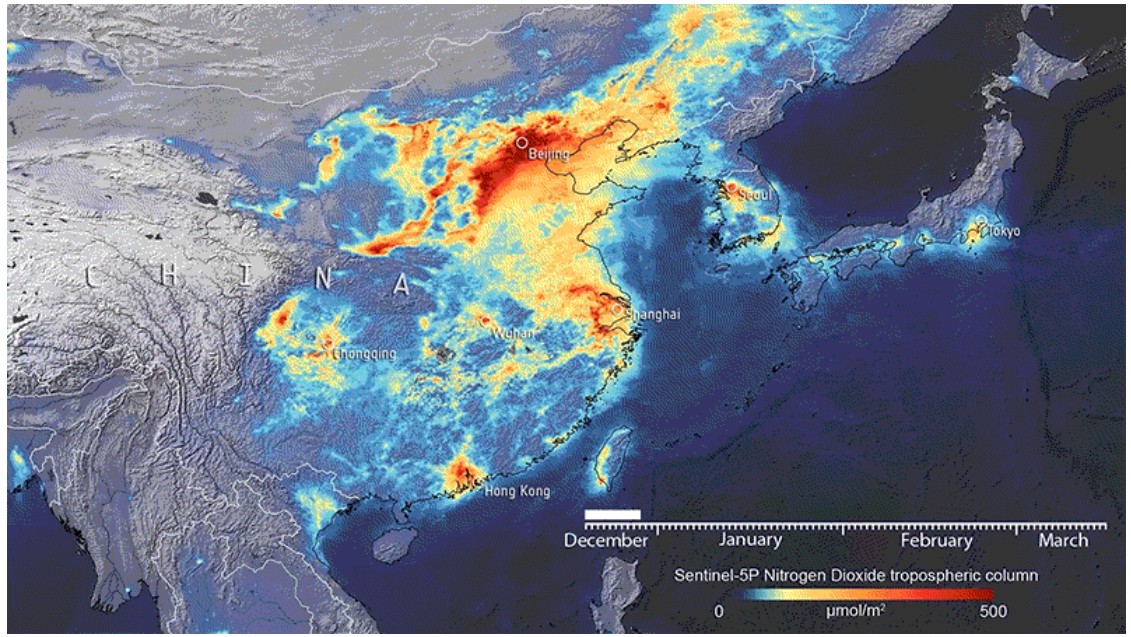
Areas of Mathematics

1. Algebra
2. Geometry
3. Calculus
4. Statistics and Probability
5. Number Theory
6. Discrete Mathematics
7. Linear Algebra
8. Mathematical Logic and Foundations
9. Topology Focus
10. Mathematical Analysis

Applied Mathematics – Two Cases

Rossmo Equation – Tracking Serial Killer

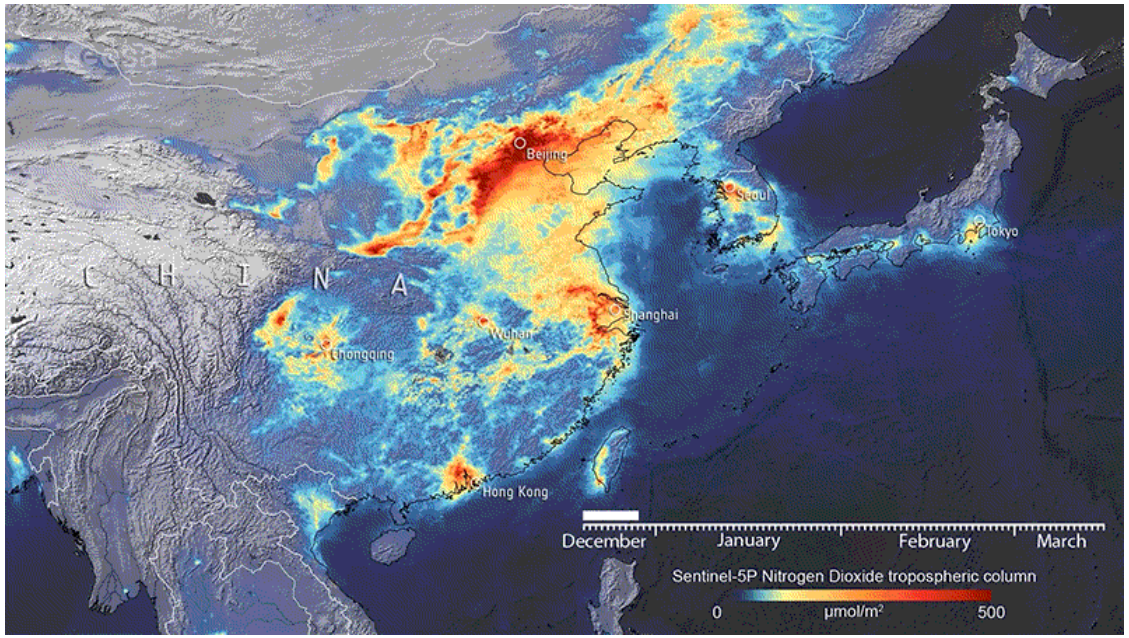
COVID (even Rumor) Spread Modeling



Applied Mathematics – Two Cases

Applied mathematics is the application of mathematical methods by different fields such as physics, engineering, medicine, biology, finance, business, computer science, and industry.

COVID (even Rumor) Spread Modeling



Rossmo Equation – Tracking Serial Killer

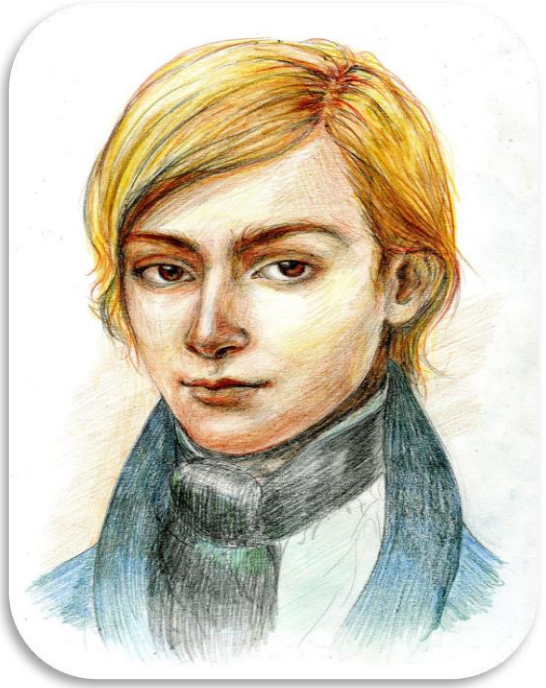
Great Mathematicians and their Works

Blaise Pascal (1623–1662)

Pascal was a French mathematician and physicist who showed early aptitude in mathematics. He started contributing to geometry and probability theory in his teenage years. Pascal's work laid the foundation for the development of probability theory.

Carl Friedrich Gauss (1777–1855)

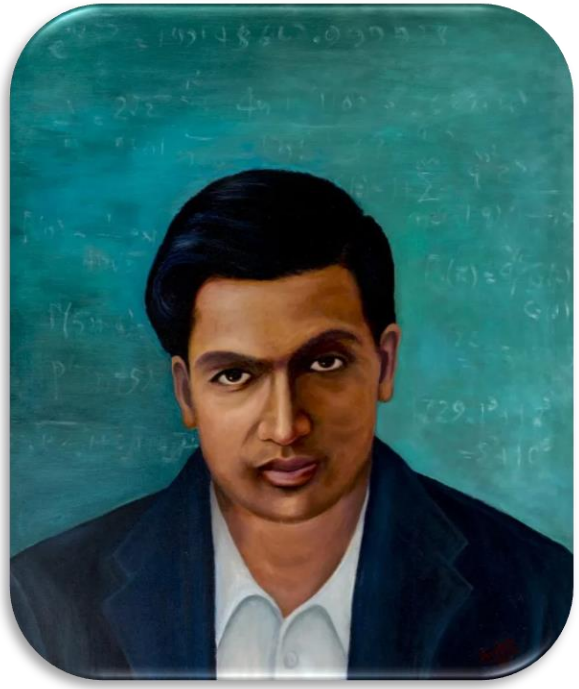
Often referred to as the "Prince of Mathematicians," Gauss displayed extraordinary mathematical talent as a child. Legend has it that he discovered the formula for summing an arithmetic series at the age of 8. He made significant contributions to number theory, algebra, and statistics.



Évariste Galois (1811–1832)

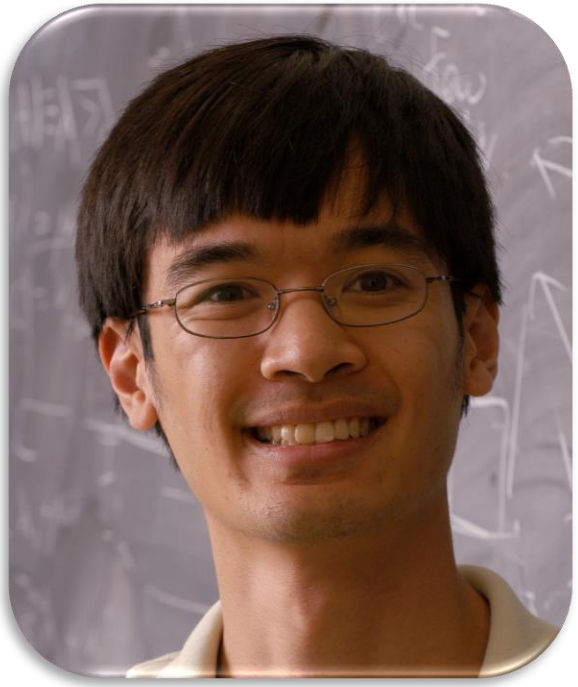
Galois was a French mathematician who, although troubled and rebellious, made groundbreaking contributions to group theory and abstract algebra. He began his mathematical journey at a young age and developed much of his revolutionary work before his untimely death at 20.

Great Mathematicians and their Works



Srinivasa Ramanujan (1887–1920)

Ramanujan, an Indian mathematician, is perhaps one of the most famous mathematical prodigies. He had an intuitive understanding of numbers and began exploring advanced mathematical concepts on his own. His work on number theory and infinite series continues to be influential.



Terence Tao (born 1975)

Tao, an Australian-American mathematician, displayed extraordinary mathematical abilities in his early years. He earned a gold medal in the International Mathematical Olympiad at the age of 13 and became a full professor at UCLA at the age of 24. Tao has made significant contributions to various areas of mathematics.

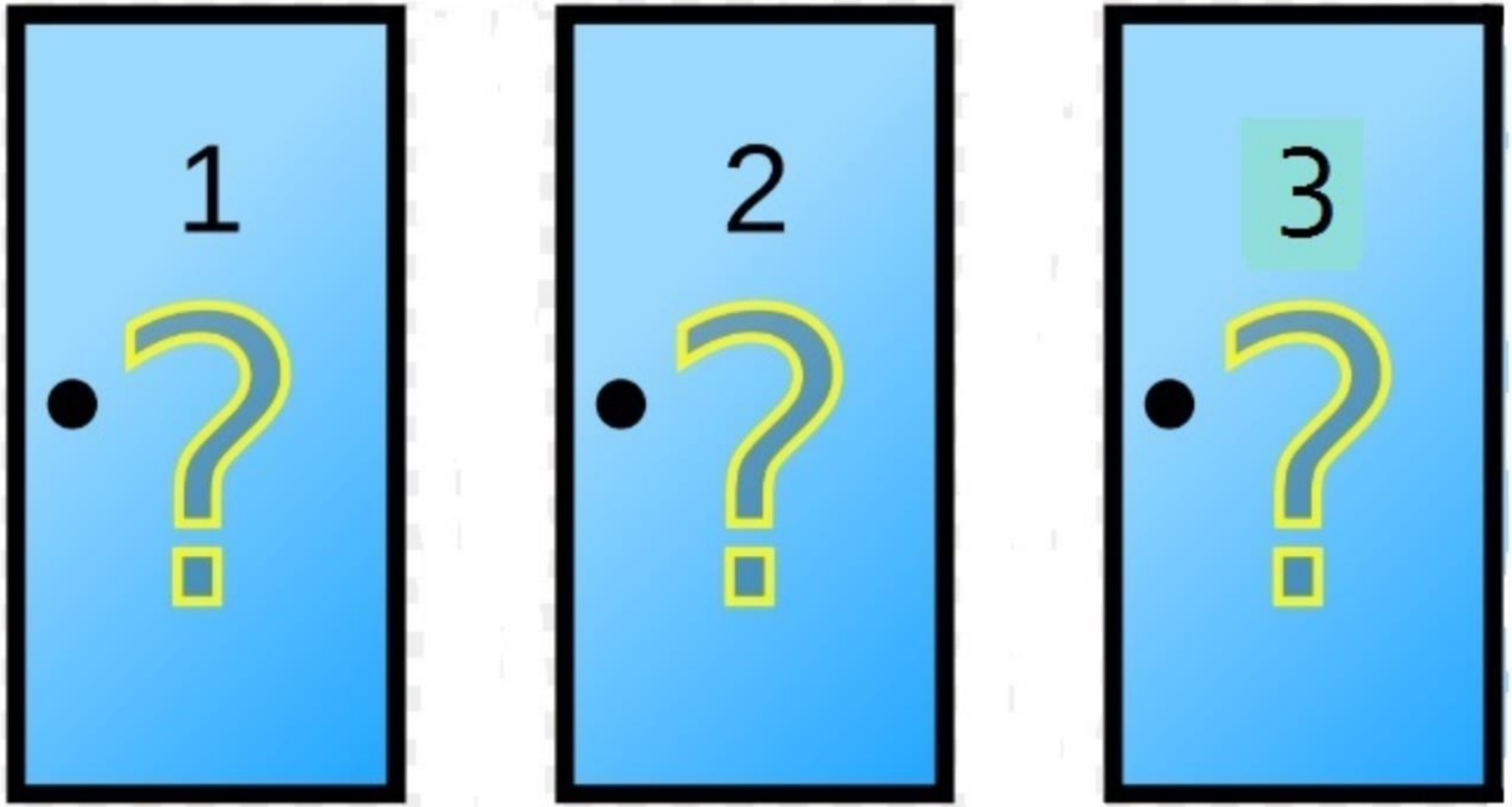
Mary Cartwright (1900–1998)

Cartwright, a British mathematician, showed early promise in mathematics and later became a distinguished mathematician. She made significant contributions to non-linear differential equations and helped advance the understanding of chaos theory.

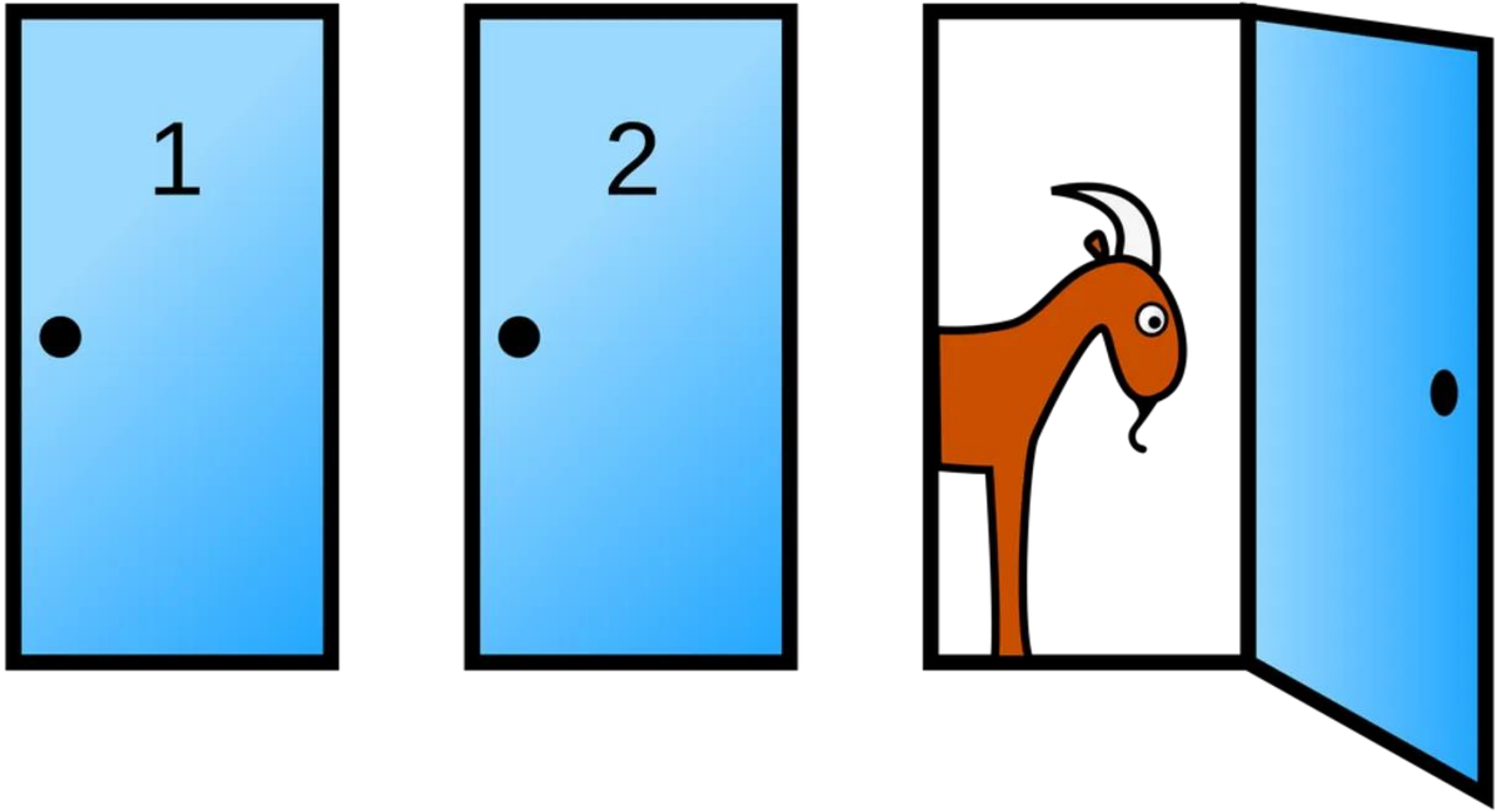
Let’s demonstrate Applied Mathematics

Welcome to the Stardust Gameshow! Press Play…

The Monty Hall Problem!



The Monty Hall Problem!



Wanna start changing the world,

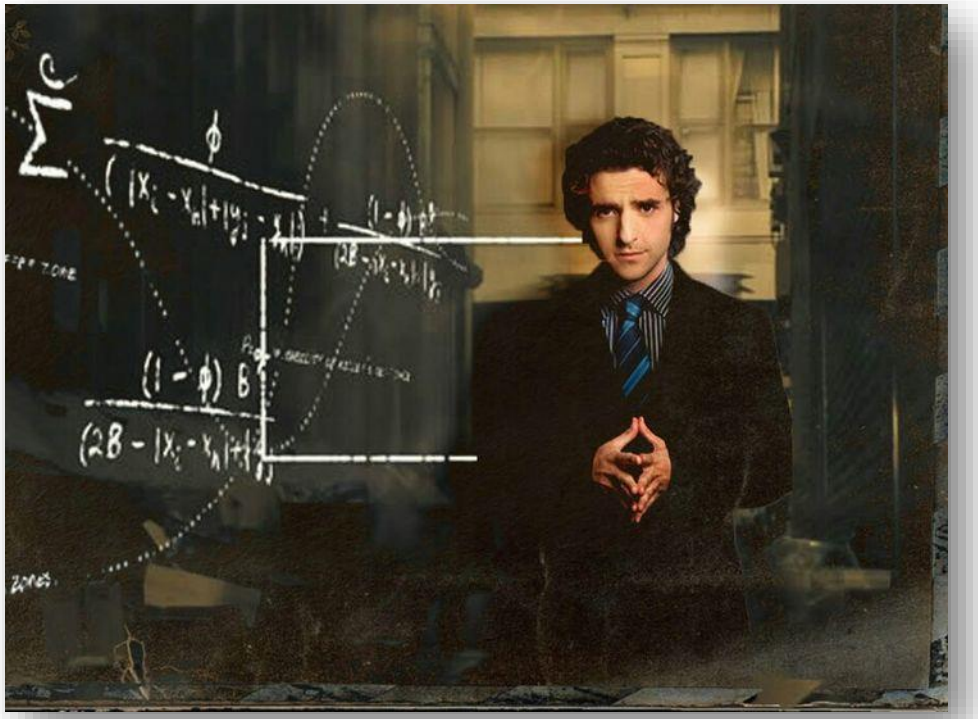
using Math?

Or even become a Millionaire?

The Millenium Prize Problems

The Millennium Problems are a set of seven unsolved mathematical problems designated by the Clay Mathematics Institute. **Each problem has a million-dollar reward for its solution**. The problems include:

1. Birch and Swinnerton-Dyer conjecture
2. Hodge conjecture
3. Navier–Stokes existence and smoothness
4. P versus NP problem
5. Riemann hypothesis
6. Yang–Mills existence and mass gap
7. Poincaré conjecture



Here’s how to start changing the world with Math, perhaps

1. There is a TV Show called **Numb3rs**, Go see it. This is not an Ad, Lol.
2. Model environmental issues
3. Analyze disease dynamics for complex health cases
4. Learn Technologies that are Math-heavy like Blockchain, Cybersecurity/Cryptography or Advance Artificial Intelligence
5. Teach Math
6. Never stop learning…

Conclusion

Be passionate and have big goals

Have something documented, something big, you plan to achieve .

Do not limit application

Apply Math to everything; at least attempt to. Even to how “garri” rises in a jug. Especially to that. Lol.

Study and Stay Up-to-Date

Keep up to date with trends in technology, science and mathematics.

Prioritize

Proper time management is necessary if you wish to succeed and stay relevant in this Century. There are a lot of easy distractions.

Have Mentors

Always consult seniors who have more experience. Ask questions to gain clarity, also ask them what you should focus on.

Be Crazy

Only those who are crazy enough to think they can change the world actually do.

Thank you.

Questions. No?