

# Gottfried Wilhelm Leibniz

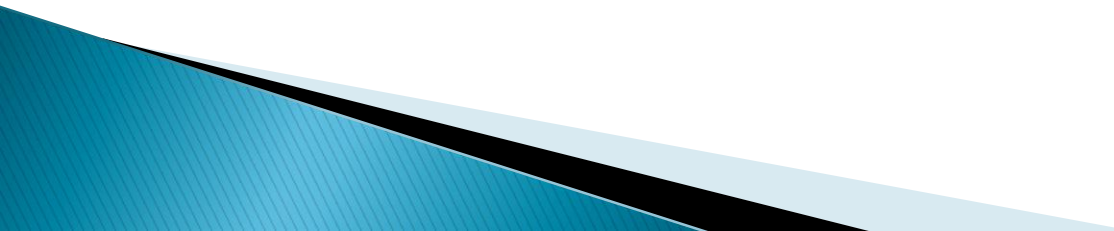
**Mathematician**



**Philosopher**

By Jennifer Armendariz and  
Ariel Means

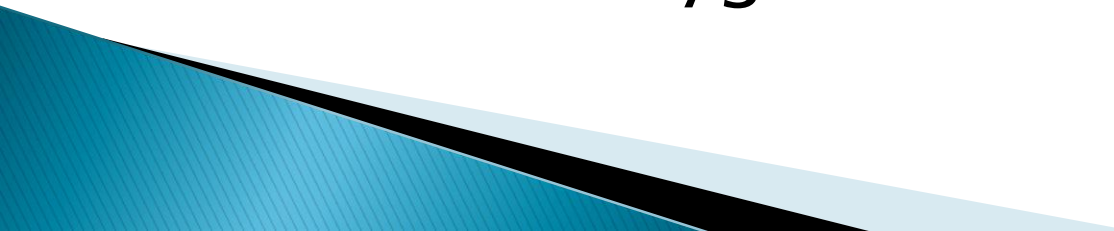
# Biography

- ▶ Born in Leipzig, Saxony (Germany) on July 1, 1646.
  - ▶ Parents: Friedrich Leibniz and Catherina Schmuck
  - ▶ Had a half-brother, Johann Friedrich; a half-sister, Anna Rosina; and a sister, Anna Catherina
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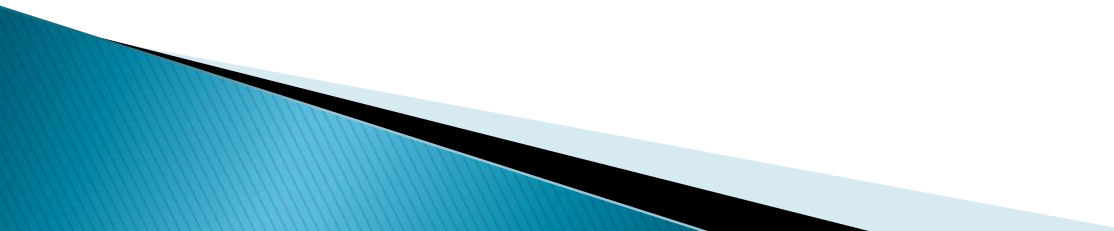
# School

- ▶ He attended the University of Leipzig:
  - Bachelor's in Philosophy, December 1662
  - Master's in Philosophy, February 7, 1664
  - Bachelor's in Law, September 28, 1665.
- ▶ He attended the University of Altdorf
  - Doctorate in Law, November of 1666

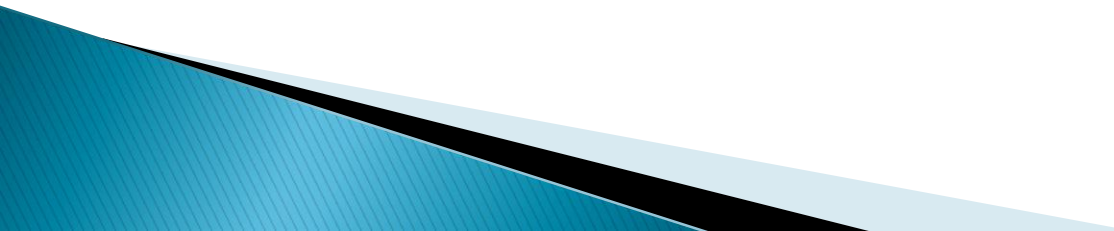
# Life in 1666–72

- ▶ Alchemist in Nuremberg
  - ▶ Assisted Von Boineburg, dismissed chief minister of the Elector of Mainz
  - ▶ Leibniz was appointed Assessor in the Court of Appeal
  - ▶ Met Dutch Physicist and Mathematician Christian Huygens
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# Philosophical Leibniz

- ▶ In philosophy, Leibniz is mostly noted for his optimism
  - ▶ The work of Leibniz anticipated modern logic and analytic philosophy
  - ▶ His conclusion was that “our Universe is, in a restricted sense, the best possible one that God could have created”
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# Philosophical Principles

- ▶ Identity/contradiction.
  - ▶ Identity of indiscernible.
  - ▶ Sufficient reason
  - ▶ Pre-established harmony
  - ▶ Law of Continuity
  - ▶ Optimism
  - ▶ Plenitude
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# Mathematical Accomplishments

- ▶ Developed the infinitesimal calculus independently of Isaac Newton
- ▶ Refined Binary system
- ▶ Leibniz's mathematical notation for differentiation...Implicit differentiation.

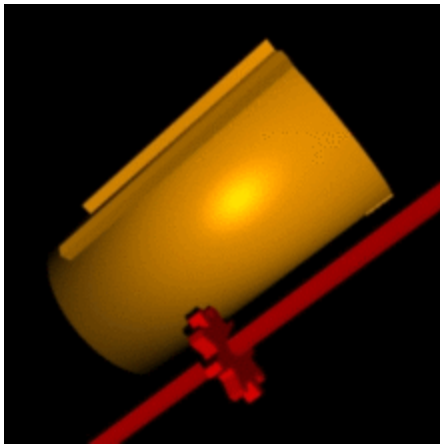
$$\frac{d(f(x))}{dx} \cdot y = f(x), \quad \frac{dy}{dx} \cdot$$

- ▶ Introduced  $\int$  sign
- ▶ "Leibniz's law" or "Identity of indiscernibles"
- ▶ Leibniz integral rule.

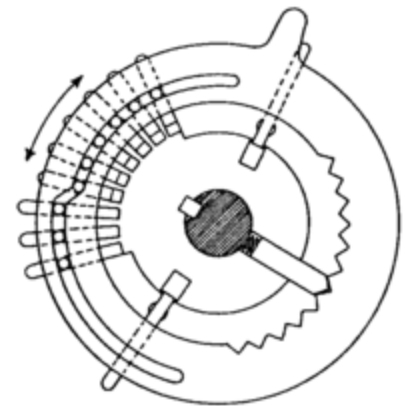


# Inventions

- ▶ The first four-operations mechanical calculator
- ▶ He invented the Leibniz wheel and was also the first to describe a pinwheel calculator

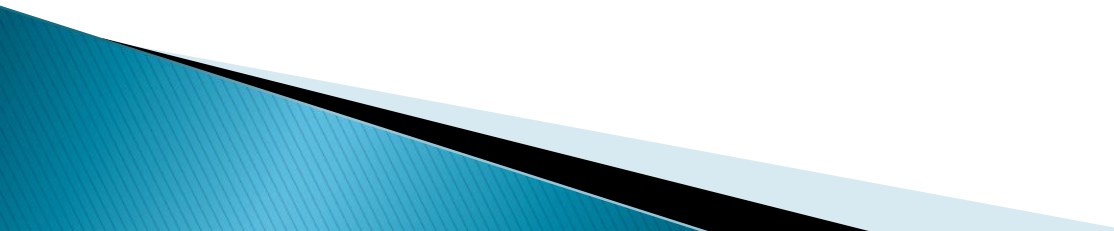


Leibniz  
Wheel



Pinwheel  
Calculator

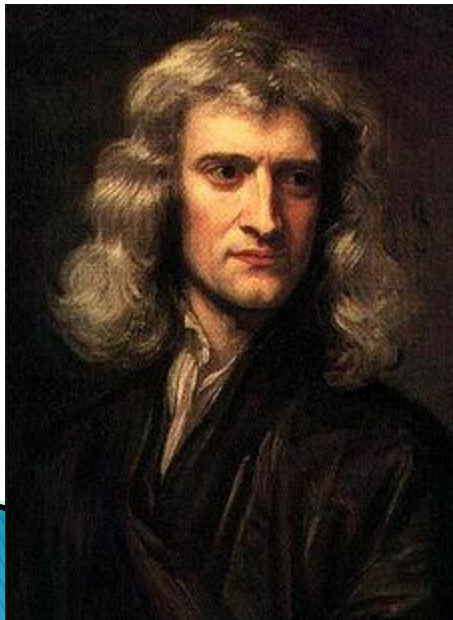
# Published Mathematical Writings

- ▶ Nova Methodus Pro Maximus et Minimus  
(‘New Method for the Greatest and the Least’)
  - ▶ Explication de l'Arithmétique  
Binaire (Explanation of Binary Arithmetic)
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# Leibniz a Liar?

- ▶ Accused of stealing Newton's work on Calculus

Newton's Work?

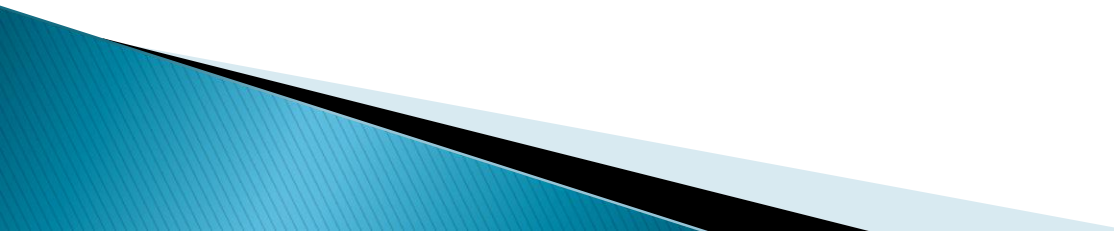


VS

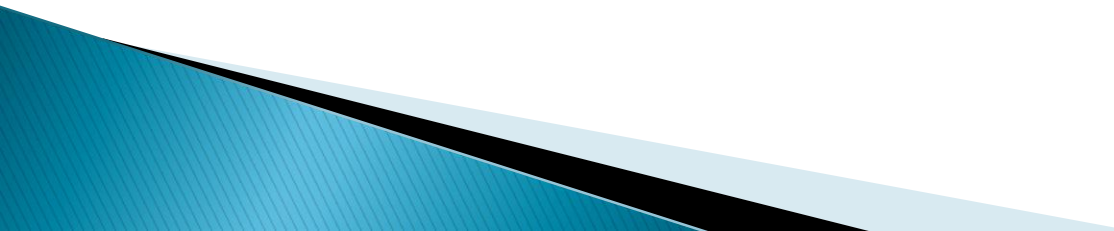
Leibniz' Work?



# Death

- ▶ Died, November 14, 1716
  - ▶ Hannover (Germany)
  - ▶ Only one person attended his funeral.
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# Interesting Facts

- ▶ Leibniz never married
  - ▶ He changed the spelling of his last name
  - ▶ He complained on occasion about money
  - ▶ No complete gatherings of his writings
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- ▶ Gottfried Wilhelm Leibniz (1646–1716) was one of the great thinkers of the seventeenth and eighteenth centuries and is known as the last “universal genius”.

–Brandon C Look



# Citations

- ▶ [http://en.wikipedia.org/wiki/Gottfried\\_Leibniz](http://en.wikipedia.org/wiki/Gottfried_Leibniz)
- ▶ <http://plato.stanford.edu/entries/leibniz/>
- ▶ Merzbach, Uta C., and Carl B. Boyer. *A history of mathematics*. 3rd ed. New York: John Wiley, 2011. Print.