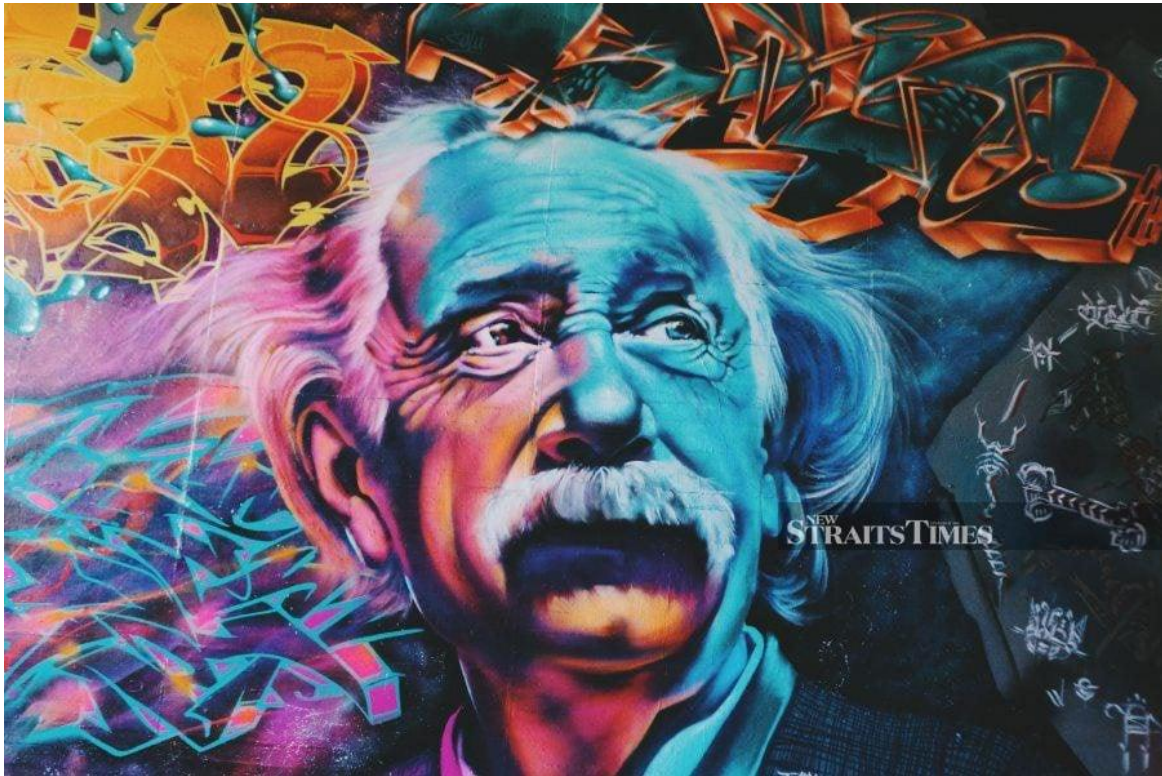


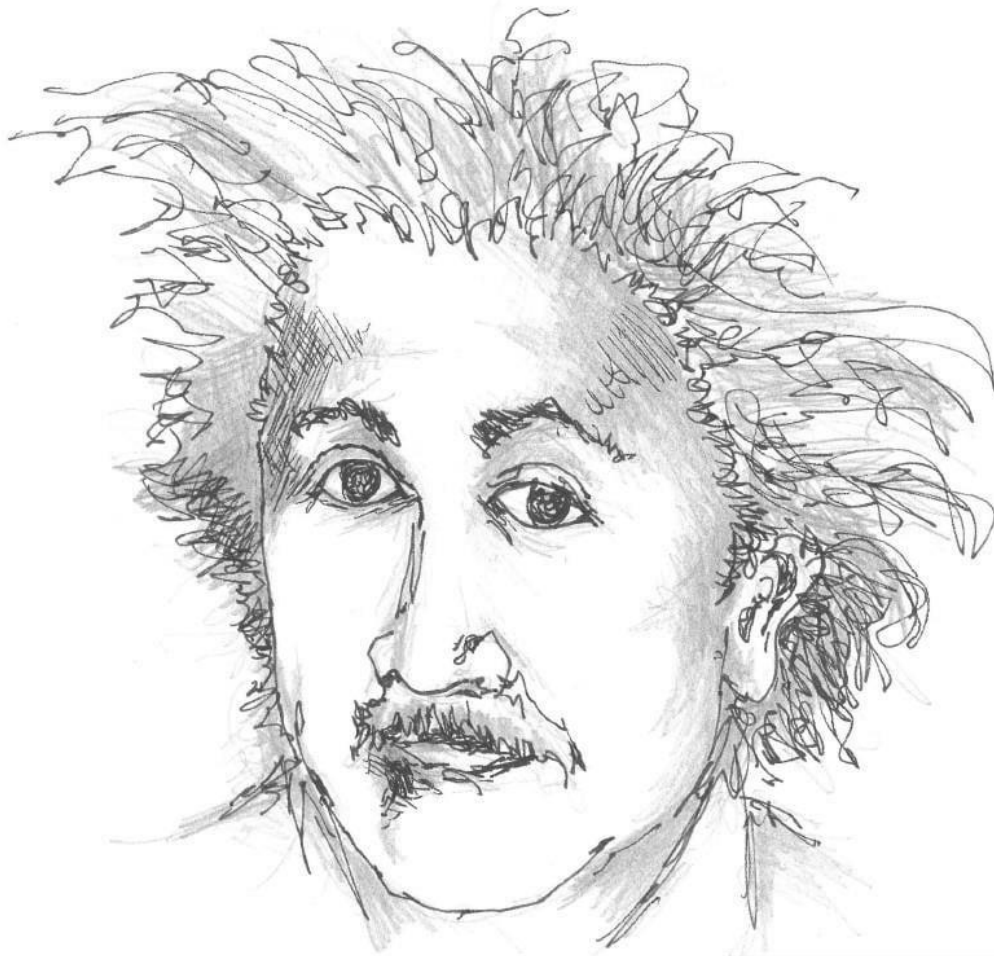
# Albert Einstein: The giant among us

By [Tan Bok Hooi](#) - March 19, 2023 @ 9:30am



SOME theories are meant to withstand the challenges of time. Yet, many have crumbled under an avalanche of experimental data that shows the results as being contrary to what have been predicted. A majority of those are due to the master strokes of the most distinguished physicists ever to walk the face of earth.

Yet, none could predict that the crumbling of the most revered edifices of physics was due to the antics of an ambitious young man, who incidentally recently celebrated his birthday. He happened to be someone who'd been holed up in a patent office trying to earn a meagre salary to support his young family.



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Einstein.

In his early days in Zurich Polytechnic, Albert Einstein could only count Marcel Grossmann and Michele Besso as his true confidants. He'd be an utter nuisance to his teachers for he advocated thought experiments by plunging into his world of imagination and embracing ambiguity with ease.

He flirted and was reckless with the heart of Mileva Maric, the only young girl in his class. He conquered her heart with the kind of passion that he serenaded the world with — through the magical melody of the violin which offered a glimpse of his brilliance.

Rebellious in nature, he'd passionately question universally accepted ideas without hesitation for he was only subservient to his own true self. Most couldn't comprehend his thoughts. Few would offer him solace in the face of adversity.

It was the loneliest journey of discovery. Yet, he noisily persevered. He battled against his own demons. He fought to reclaim his rightful place. Rigorously he tried, but with countless failures littering the streets all the way home.

He took Maric's hand as his bride after battling the demons strangling his confused mind. They collaborated in ways still up to intense debate since Mileva Maric was an accomplished mathematician.

When his novelty on photoelectric effect was introduced to the world it received lukewarm response among the scientific fraternity. He boldly embraced Max Planck's idea of light quanta though it had yet to receive experimental verification. However, his predictions were in line with experimental data which saddled many in a quandary.

## BEYOND FRONTIERS

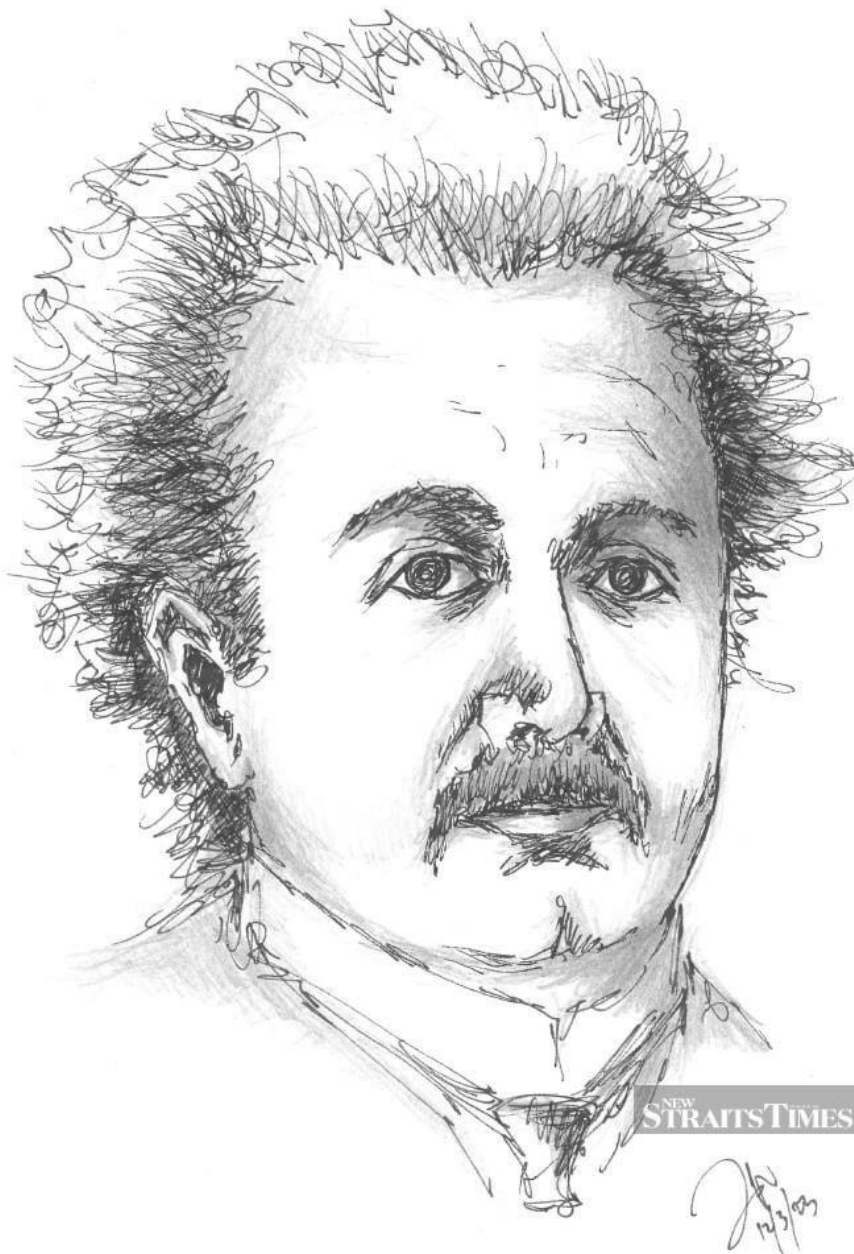


Einstein's imagination had no frontiers.

Einstein was only a patent clerk. Not even one of them. So how could he ever be taken seriously? Yet he refused to be intimidated by the deafening silence. He then arduously worked on a more difficult problem related to atoms. His imagination

extended beyond the universally accepted frontiers for he must demonstrate originality in his problem-solving methods.

He would, by now, had the fortunate company of Michele Besso in the Swiss Patent Office to motivate him further by recruiting him as an active participant in many of his bizarre thought experiments. The groundbreaking paper with respect to atoms was published; yet it was received with little fanfare, much to his bewilderment.



A sketch of Albert Einstein.

So, he persevered with even greater intensity than before. He was determined to receive the rightful accolades. He returned to the question on behavioural patterns of

light and how it might change if the source of light would be in a moving with constant velocity.

He'd then take his bike out for a ride in the countryside when the sun was smiling broadly on a beautiful sunny day. One fine day he discovered the answer to the riddles that had bugged him since his early childhood days.

In a single act of defiance, he'd brought Isaac Newton's centuries-old adage of time to a halt. Time no longer flows on its own accord. Time could be stretched, warped, or shrank depending on the dynamics of the observer.

The Newtonian concept, which stated that time flowed inexorably forward undisturbed by nature, had been shattered instantaneously. Few dared to challenge the established norms. But he was never meant to be like them.

## **EXTRAORDINARY DISCOVERIES**

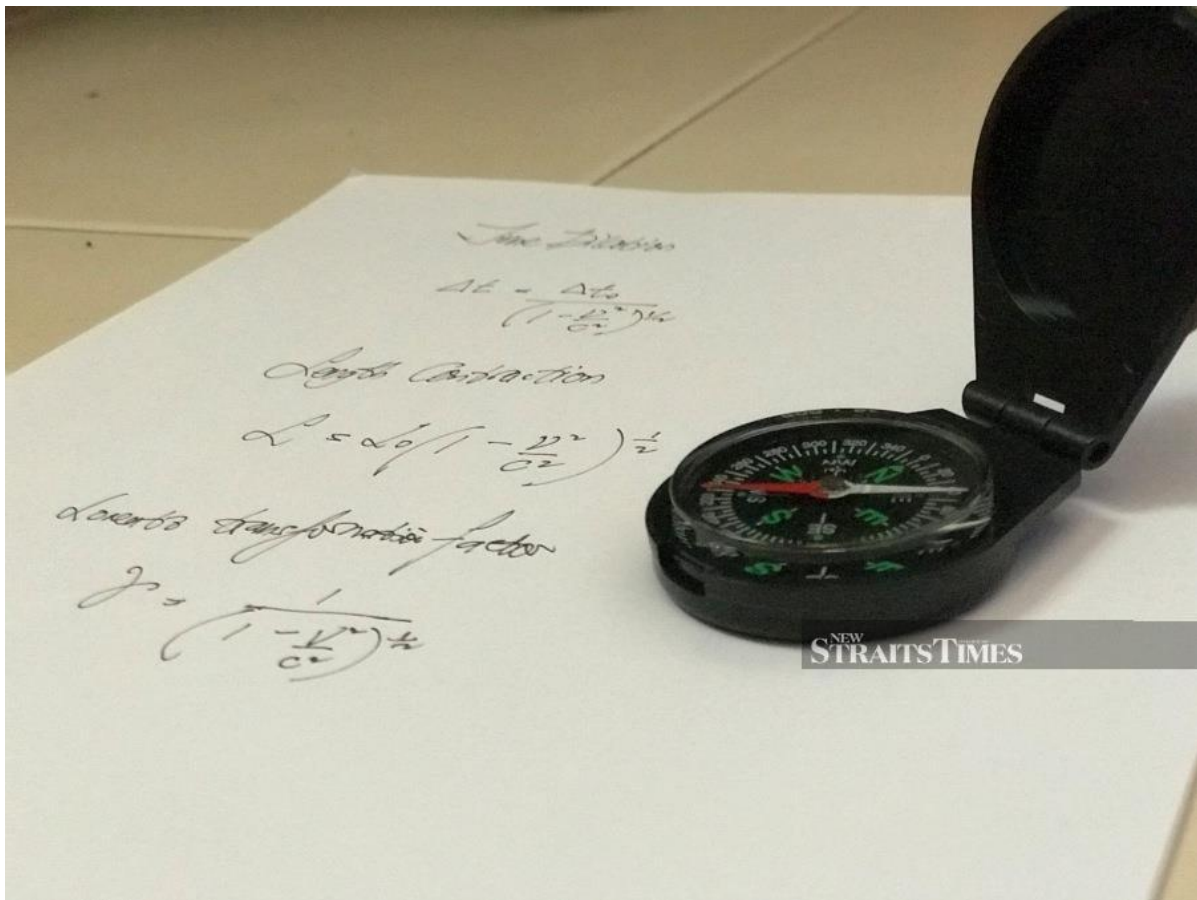


The author at Einstein cafe.

Einstein was a man seeking the truth, and nothing but the truth would satisfy him. He was beholden to none. A master in a universe of his own, he was determined to forge ahead without fear or favour.

Yet, his revolutionary ideas faced contempt and prejudice aplenty. None could be proven yet. So, was it just a figment of the imagination of a lonely patent clerk seeking redemption? Unperturbed and singled mindedly pursuing his passion, he found the patent office to be his safe haven where his mind wandered through the outer frontiers of the universe finding ways to fathom how the universe operated with such astonishing precision.

Yet, as he proceeded to revolutionise the concept of matter and energy, and how these entities were intimately related oblivious of the utter chaos grappling the scientific community, his astounding work found its way to Max Planck, a well-respected physicist in the scientific community.



Einstein was given a compass by his father, Hermann when he was five years ago and he wondered what kind of force would be so powerful to ensure the needle always pointed in the same direction.

After his earth-shattering work in relativity, where he tweaked Galileo Galilei's understanding of the concept of frame of reference and guided by Michelson Morley's phenomenal insights into the existence of ether, he cleverly utilised Hendrik Lorentz's transformation to underscore the importance of the concept of light as a constant, culminating in a series of equations that forever altered the perception of motion with a constant velocity.

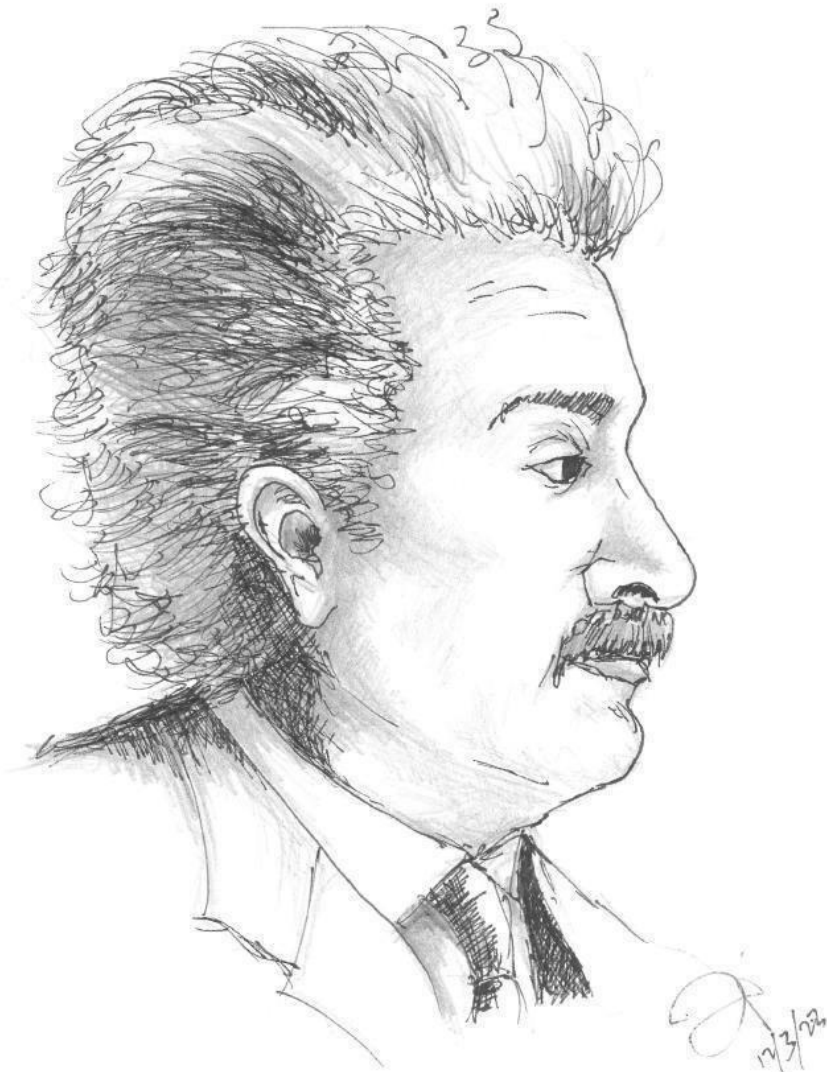
His comprehensive embrace of the velocity of light screeching ahead as a constant was due to his unshackled belief in the mathematical genius of James Clerk Maxwell

who unified electricity and magnetism in a series of four simple mathematical equations.

Yet, simplicity is always the ultimate sophistication.

## **DESIRED BREAKTHROUGHS**





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Einstein is widely acknowledged to be one of the greatest and most influential physicists of all time.

Einstein's extraordinary discoveries by utilising his mind to ponder the frontiers of the universe without the assistance of any complex data-churning machine has been earmarked as *annus mirabilis*, the miraculous year of 1905.

After four mind-blowing scientific papers in *Annalen der Physik* and an incomprehensible degree of frustration, he finally landed a job as a lecturer at the University of Bern, Switzerland in 1908.

Knowing very well that his theory needed to consider objects experiencing acceleration or otherwise, he boldly commenced his quest for the extension of his special theory of relativity. However, he was ill equipped with the mathematics needed to make the desired breakthrough.

He anxiously sought assistance from Marcel Grossmann who opened his sparkling eyes to Riemann geometry. Dabbling with tensor algebra and getting accustomed to be a student all over again was never part of his grandiose plan, yet he understood the need to master the new mathematical tools in order to realise his dreams.

He relentlessly pursued, yet the elusive goal was still buried under a pile of debris. His inability to complete the jigsaw puzzle attracted the attention of the celebrated German mathematician David Hilbert who took up the challenge himself to complete the seemingly impossible task.

Hence the race to the finish line dragged two of the most celebrated physicist and mathematician into an unlikely duel fuelled by the hunger to unlock the keys to the universe. Hilbert vanquished him to the finish line, yet he found Hilbert's costly mistake and was able to beat him by a whisker to the final seemingly incomprehensible equations that provided the necessary corrections to Newton's incomplete gravitation law. His prediction of gravitational waves unsurprisingly took more than a century to be discovered.

The very moment his predictions were proven by an experiment related to the eclipse of the sun in 1919, he became a household name overnight. Sir Arthur Eddington led an expedition full of expectation yet he didn't disappoint the crowd with findings.

Much earlier on, Erwin Finlay-Freundlich, a young German astronomer, eager to stamp his mark in the scientific fraternity, was left ruining his chances after being accused of being a spy when World War I broke out as he attempted to cross the border to Russia to make the necessary observations.

Had he succeeded in doing so, he'd have proven that the sought-after theory had major flaws. The accidental mistake was only discovered much later and rectified before further damage to the reputation.

His very first budding romance was with the charming Marie Winteler when he enrolled in a Swiss Cantonal School in Aarau in 1895. By the time he set foot in Zurich Polytechnic, he succumbed to the mesmerising beauty of Mileva Maric, a promising Serbian mathematician whom he'd later tie the knot.

He had a romantic entanglement in the later years with his cousin Elsa. A bitter divorce settlement included pledging the prize money to Mileva Maric if he were to be bestowed the Nobel Prize. He had Elsa by his side for much of his life, including his migration to the United States of America when the Second World War erupted.

## ONE AND ONLY ALBERT EINSTEIN



Alex Tan Bok Hooi.

Born in Ulm, Germany on March 14, 1879 Einstein's intellectual curiosity drove him into a maddening search for the ultimate truth. When he was given a compass as a birthday gift by his father during his teenage days, he wondered what kind of invincible force with such tremendous strength could possibly move the needle of the compass.

His imagination had no frontiers. His pursuit recognised no boundaries. His unbridled love for physics overwhelmed everything else. He's the one and only Albert Einstein.

*Tan Bok Hooi has a postgraduate degree in particle physics. An author with six books to his credit, including two Malay novels, he's also an entrepreneur in the healthcare ecosystem with special focus in consultancy, talent acquisition and conducts high impact personalised coaching sessions. He loves Lord of the Rings Trilogy and the Star Wars Series. He has a penchant for dragon fruits. He can be reached at [bokhooi@yahoo.com](mailto:bokhooi@yahoo.com)*

