

Numbers and stats don't lie ? we are all miracles!

by Mark Pavilons

We were given the most precious gift of all, through all the odds, twists and turns, global events. We emerged from a loving mother, and hopefully welcomed into a gracious family.

We had no choice where, when or to whom we would be gifted. Given the vast array of situations and inequities on this planet, we could have ended up on desert plains, snowy mountains or modern, urban centres.

We could have been brought into this world by a tribal shaman or aristocrat's midwife.

Unlike the Christ child, our fate, future, path, journey and entire lives were uncertain. Some of us, past our prime, are still trying to sort things out.

No matter how you look at it, YOU are nothing short of a miracle. We are a mathematical oddity.

If you examine the numbers and data in physics, chemistry, geology, cosmology and astronomy, it seems like we're here for a reason. One scientist believes the universe saw us coming.?

Cosmologist Roger Penrose calculated that the Big Bang and the universe's initial expansion occurred within a window so narrow that any deviation would have prevented stars from forming. The late Stephen Hawking said that if the rate had differed by one part in a hundred thousand million million, the universe would have either collapsed or expanded too rapidly for stars to form.

The early universe's formation revealed astonishing uniformity and an unfathomable precision.

Perfect math if you will.

If density variations had been just 0.0001% greater, excessive gravity would have collapsed the universe; 0.0001% less, and matter would never have come together into galaxies at all.

So, my fellow miracles, the universe was like a nursery, paving the way for humans. Talk about beating the odds and being welcomed into existence.

Then came our small, quiet planet, tucked away at the outer rim of the Milky Way.

Earth maintains its position within a habitable zone so narrow it allows liquid water to exist. Just 5% closer to the sun and we'd experience a greenhouse effect like Venus (over 900°F). And 20% farther and we'd become a frozen wasteland like Mars (average -80°F).

This is a precise orbital choreography, hand-made for we humans.

Our planet's atmosphere is composed of precisely 78% nitrogen, 21% oxygen, 0.9% argon, and 0.1% trace gases mixture that sustains complex life through an extraordinarily delicate balance.

Just 4% more oxygen would make forests spontaneously combust during lightning storms, while 4% less would make complex animal life impossible.

Our gravitational pull strikes the exact balance needed for complex life strong enough to retain an atmosphere but weak enough to

allow large organisms.

British physicist Brandon Carter noted that even small gravitational variations would make trees structurally impossible, preventing ecosystems from developing oxygen-producing forests and complex land animals.

And let's not forget our biggest partner ??ur unusually large moon. At roughly 1/4 Earth's diameter, it stabilizes Earth's axial tilt at a nearly constant 23.5 degrees. Without this precise stabilization, Earth's tilt would chaotically oscillate between 0 and 85 degrees over millions of years, causing extreme climate fluctuations incompatible with complex life.

The moon formed through an extraordinarily precise collision with a Mars-sized protoplanet.

This cosmic accident had us ?winning the lottery.?

The origin of all life on this planet is even more unbelievable.

Simple protocells require at least 10-15 specifically arranged molecular systems functioning together to create life. While simple organic molecules form naturally, the leap to integrated, self-sustaining systems would require at least 382 genes arranged in a functional sequence.

Eukaryotic cells ??he foundation of all complex life ??rose through what evolutionary biologist Lynn Margulis described as an ?improbable endosymbiotic event? where one bacterium somehow took residence inside another without being digested, eventually becoming mitochondria. Biochemist Nick Lane's analysis shows this event was so extraordinarily unlikely it probably occurred just once in Earth's history, roughly 2 billion years ago.

All of these things so far in this journey to creation are staggeringly improbable. Hello Mr. Improbable; good day Ms. Extraordinary.

And what paved the way for us to be walking upright, using our hands and brains?

Scientists say high intelligence evolved just once, concluding that intelligence is not an evolutionary inevitability.

Human brain development required a perfect storm of unlikely factors: bipedalism freeing hands, precise vocal apparatus changes enabling speech, specific dietary shifts increasing available energy, and unique social structures supporting language. Despite sharing over 98% of our DNA, even our closest primates never developed language, mathematics, technology, or abstract reasoning anywhere approaching human capability.

The staggering mathematical improbability of these and other factors aligning perfectly demands our ?deep gratitude.?

We exist in a universe where countless variables had to be calibrated with impossible precision for conscious life to emerge. This knowledge transcends scientific disciplines and philosophical divides, making us marvel at our extraordinary cosmic situation.

Whether through chance, necessity, design, or multiverse, our existence represents what physicist Paul Davies calls ?the biological equivalent of a miracle.?

Yes, my friends, you and I?are miracles, so rare and mathematically unlikely that we should embrace our frozen tundra or high-rise amenities. We should be amazed every time we shake hands and smile at one another.

When you dial your phone to order Uber?Eats, trillions of things would have had to come together to allow this to happen. And the person delivering your food is equally as ?improbable? as you.

From one miracle to another ??ongratulations. I'm glad we made it this far.

(With information from Chuvic, ?Were the odds ever in our favor??25 statistical proofs that life is a miracle,? Science Sensei.)