Solar eclipse and the advent of science

Out of the Box

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THE TOTAL SOLAR eclipse which happened in the United States two weeks ago made the news headlines worldwide. Enthusiasts from around the globe made their way to the United States to witness what could be a once-in-a-lifetime natural phenomenon. Many of my friends in the United States stopped work for a moment on that day to see the sun disappear.

Certainly, these natural events are of great interest to many people, independent of location, culture and wealth. The wonderment of nature never ceases to amaze, and it is shared by all human beings.

Not so long ago in the history of civilization, humans had no idea how a solar eclipse came about, and would react to the dramatic event as if some supernatural being was exercising its power over people (hence all the superstitious interpretations).

With the advent of science, not only do we now understand such phenomena, but we can quantitatively predict them with great accuracy. We can now send spacecraft across the universe with a few simple physical laws (started by Johannes Kepler, Nicolaus Copernicus, Isaac Newton and Albert Einstein, among others). This is a much bigger deal than creating some tech gadgets, but at the level of the development of religion in human civilization – which provides a way to "understand" and "explain" the world but in a very different way.

When I was working at the US National Science Foundation, one of my major duties was to secure funding for basic science, including astronomy, and it was challenging to convince authorities to give adequate funding to the cause, because the impact in basic science is hard to realize within political cycles.

But if we look back to the age of the industrial revolution, all breakthroughs can be traced to some basic science discoveries. The steam engine replacing physical labor was the start; followed by the advent of electricity, which has changed how we live and communicate.

The advent of computers (which only took place 30 years ago) changed how we process and exploit information, and the current widespread use of the internet, fast developing power of artificial intelligence, shared economies, have made our lives more efficient and interesting (while threatening jobs).

Modernization and technological breakthroughs did not happen by themselves.

These were combinations of factors, with scientific discoveries and innovative engineering, and with people who dare to challenge conventional wisdom to bring forth new inventions to benefit humankind.

Without Newton's scientific basis and James Watt's steam engine, we wouldn't have the trains and automobiles of today.

Without James Maxwell's understanding of electricity and magnetism, and Thomas Edison's inventiveness, the lightbulb and other electrification of our daily life would not have existed.

Without Claude-Louis Navier and George Stokes' equations of fluid mechanics, and the daring Wright brothers, we wouldn't have modern aircraft.

And without Alan Turing and John von Neumann, we would not have the computers we take for granted today. These inventions all happened not because the inventors thought they would make big money from it – they started with a dream or a challenge and put in hard work with conviction. They wanted to understand nature, make something new happen, and they ended up changing the world.

As a scientist/engineer myself, I have always believed that science is not just about making money: it is about discovering and understanding the world around us, which is a very basic urge of humans.

And it is amazing that we humans can actually manage to do it. This capability is what distinguishes us as a species from others and, throughout history and even now around the world, it has always drawn some of the brightest minds to the cause.

Alas, in some highly distorted "eco-systems," like Hong Kong, such natural curiosity seems to be almost totally suppressed by monetary pursuits, and sometimes to the degree of obsession.

As educators, we must seek to change the narrative that perhaps has tilted in favor of money-making skills for far too long. Any advanced and wealthy civilization (like Hong Kong) should feel an obligation and pride to contribute to the collective human endeavor to understand and discover the world around us.

The rest of the world has always done it, and will continue to do so.

But will Hongkongers have the fire to join them?