Where is My Flying Car Symposium

**Visions of the Future**

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Scientists develop a healthy creativity for imagining what the future holds by asking “what if?” So do science fiction writers and four of them shared their visions for the future involving achievements in travel, identity, space, and the environment during a panel discussion at the 2014 AAAS meeting in Chicago.

Advancements in travel are fundamental to an evolving contemporary society. As Earth’s mutual resources dwindle while the human population continues to grow, science and science fiction have focused on imagining a future where humans will be able to travel off-planet to expand society’s resources.

Dr. Lawrence M. Krauss, Foundation Professor of the School of Earth and Space Exploration at Arizona State University and director of its Origins Project, is a theoretical physicist who has spent much of his career considering the plausibility of traveling off planet. His book, *The Physics of Star Trek*, examines the classic science fiction television show “Star Trek” with the eye of a professional physicist. During the AAAS symposium, he explained three potential methods of future space travel: space-time manipulation, teleportation, and rockets. He said that humans could potentially cross vast interstellar distances in a blink of an eye if they could manipulate wormholes, which are a bending of the space-time continuum. The hope is that future technology will enable humans to move to two locations in space together, like folding a sheet of paper together so that the two points furthest from each other touch. If this becomes possible, humans would be able to cross the galaxy in as much time as it takes to walk through a doorway, Krauss said

The second method of future travel, teleportation, would be possible if society becomes able to clone a person perfectly, down to the last molecule, Krauss said. With this technology, we will be able to reproduce a person located at point A in another location at point B, he explained. This is similar to the teleportation method seen in Star Trek, giving rise to the popular phrase “beam me up Scottie!” However, Star Trek’s “beaming” differs from the travel method proposed by Dr. Krauss because a Star Trek character’s individual molecules were disassembled at point A and reassembled at point B. Dr. Krauss proposed that to actually achieve teleportation, an exact copy of a person would need to be made somewhere else in the universe. The ethical pitfall, however, is that this will create two identical copies of the same person and there will be no way of knowing which twin is the original person, he said

Finally, and most realistic given modern technology, is rocket travel to deep space. Today’s society is working hard to make this possible, although Dr. Krauss pointed out that the major flaw of rocket travel is the cost and quantity of fuel required to explore the galaxy. Traveling by rocket may be plausible for exploring our solar system, but will cost an enormous amount of money for enough fuel to go beyond that.

If human society is able to adopt a method of off-planet travel, what would people find hidden in the darkness of interstellar space? Dr. David Grinspoon, an astrobiologist with the Library of Congress, uses his professional background to realistically assess the possibility of alien life thriving on another planet, and how today’s society can work to find such life. Dr. Grinspoon has studied the possibility of life on Venus, the planet closest to Earth. In his book *Venus Revealed*, he conjectured that the high humidity of Venus’ atmosphere makes it a likely candidate to hold life. However, this theory was debunked when NASA was able to send a satellite on fly-by mission revealing that Venus’ surface temperature is more than 800 degrees Fahrenheit.

Although life on Venus was ruled out as a candidate for housing alien life, Dr. Grinspoon conjectures that it is still possible to find life hidden in interstellar space. He posited that “by studying Earth more extensively in comparison to other planets, we will be able identify the markers that make a planet habitable.” With society’s rapidly increasing technological breakthroughs, it will be no more than a few generations down the road before we discover thriving alien life forms in the universe, he said.

Yet as humanity achieves technological advancements and revolutionizes the world of today, it is possible to lose sight of what it means to be human. Human identity must evolve along with technology, or our society could lose touch with human values. Disabilities that were once crippling can now be treated through bio-enhancements, and increased computing power has given rise to the creation of artificial intelligence (AI).

Dr. Catherine Asaro, a science fiction writer with a focus on bio-enhancements, elaborated during the panel discussion on how the contemporary perception of “human” must change. Future generations will not have the same social norms that differentiate natural and artificial, she said.

Today, technology allows amputees and others with physical disabilities to supplement physical disadvantages with bio-enhancements. Asaro asked: Do these bio-enhancements make a person less human than another who is biologically whole? Mapping of the human brain has given rise to AI software that has the capability of making autonomous decisions. Does AI have a human soul? These tough questions, Asaro said, will force society to consider what it means to be human in a world of rapidly advancing technology.

A timely example of society choosing to technologically advance at the cost of ethical values is the industrial stamp that society has left on the global environment. The future health of the environment is critical for the ability of future generations to thrive and prosper, but modern society is driven by industries that pursue economic advantage at the environment’s expense. Dr. Kim Stanley Robinson is an award-winning science fiction writer who carries the theme of ecological sustainability throughout his books. His vision for the future of Earth’s environmental sustainability is inextricably tied to today’s global and national economic landscape.

Dr. Robinson suggested that “environmental sustainability is dependent on a global economy that make ecological sense.” His most potent example was global drilling operations and the multi-national corporations that are responsible for supplying oil and gas to the world. These companies have discovered vast reserves of fossil fuels deep beneath the earth and have put these energy resources on their balance sheets as assets. The environmental damage of burning the thousands of gigatons of fossil fuels trapped in the earth will rapidly accelerate global climate change. The oil and gas companies need to extract the resources and sell them to pay back investors, Dr. Robinson said. Even as environmental activists call for reduced numbers of drilling operations in efforts to mitigate climate change, drilling companies continue to dredge up oil and gas to enhance their profits and achieve financial ends, he said.

Dr. Robinson suggested that to combat environmental degradation at the hand of economic pursuits, there must be strong civilian oversight of those industries that have the largest impacts. Much like the National Science Board that provides oversight of the National Science Foundation, there must be civilian groups that will weigh the economic and environmental costs and benefits of certain industries, he said.

As one of the symposium speakers pointed out, science fiction employs storytelling about important scientific discussions to spark the imaginative flame that drives society’s innovation. Although many ideas created in the science fiction genre are futuristic, improbable, and some downright absurd, they may be a key to developing creative solutions that will help ensure future generations’ survival and prosperity.