

Essay on the Benefits of Space Development

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I know why the word *if* has inspired the rise of mankind through time. If I rub these two sticks together will I have an ember? All work, triumph, and tragedy begin with an *if*. These two letters have driven the course of everything. *If* has allowed us to forge the hinges on which innovation and discovery are swung. We are born to question. Leaders, scientists, philosophers, and artists ask the simple question, and *if* is the fulcrum from which the answer is discovered. *If* is the mover of all time and of all history. It is my understanding that *if* is the foundation on which all of human knowledge and innovation stems. When one stops and considers the many different questions that still preside over the human race the exploration and development of space travel remains a critical *if*. The cliché is appropriate that space has become the final frontier of human discovery. It goes without saying that space travel is something that we have only scratched the surface of. Space development is the next step in the cogs of innovation because of how much it provides, as well as the infinite possibilities that it presents. It is the ultimate if-- the ultimate question.

The International Space Station provides the paramount opportunity for world collaboration. The station provides an opportunity not only for diplomacy and unity, but also it provides the possibility for the diffusion of scientific knowledge and ideas across the globe. Each country involved provides key innovation to the elemental purpose of a joined space station. That purpose, simply stated, is the generation of scientific discovery. One cannot discount that Aristotle said it best “that the whole is greater than the sum of its parts.” The innovation and discovery that has already risen from what the space station has accomplished is beyond anyone could have predicted. The benefits to scientific collaboration in the International Space Station has produced more than its theoretical yield. For one, the station has provided the chance to open a low orbit commercial market, which allows the private sector to conduct business and their own research in space. Additionally, NASA water purification technology is saving lives in at risk areas. Using station technologies, they are providing drinking water to those in need. Certain proteins

that are key in developing certain drugs are being developed in space, helping with those suffering from disease. Finally, through the collaboration in the International Space Station Zero Robotics, a program for young children where they are given the opportunity to work on their own research on the actual space station itself. The cooperation of the world's countries in developing the research station has allowed for the dispersal of knowledge and ideas across the globe. The developments of technology and the discoveries that have been made and will be made are too numerous to count. The pursuit of that ever present "*if*" pushes us further down the road of human discovery.

Likewise, it can be argued that space development will expedite medical discovery by leaps and bounds if pursued further. Zero gravity provides the opportunity for so many options that are not available on the ground. It provides a whole new platform for treatment and drug development. Improving global health is an action well worth striving after. For one, studying how bacteria become pathogenic and virulent has allowed for the development of stronger and more effective vaccines. In the treatment of pathogens, it has been discovered that zero gravity and microgravity offer improved techniques for studying the behavior of bacteria and how to fight them. However, one of the largest medical developments was the robotic arms for surgeries. Surgery has always had a margin for human error, and the robot eliminates some of that chance for human error. Brain tumors have been since removed with no complications using the arm. This is not the end of the improvements to surgery that the space station provided. Eye surgeries have been improved with technologies developed in space as well. Space development is also improving future human health as well. Osteoporosis, a disease in which bone mass is lost, is now treatable with developments made in research on the station. In zero gravity, bones lose mass quickly and methods had to be developed to stop the loss of mass. Space development can only continue to help with both making space travel more efficient and ground life more bearable. *If* humanity is willing to push further into space development and research what can we discover? The medical potential that space holds is too important to disregard or slow.

Additionally, space development will employ thousands potentially in every aspect of what it will become. Human potential in the most physical sense is the most immeasurable truth. The potential for

what space development will provide to that potential is an “*if*” in and of itself. Already, space travel is beginning to commercialize and privatize business. Private enterprises will take pressure off of the government to control space travel and regulation. Costs will become transparent and markets will be created where none existed before. Startup companies have already sprung up with the ambitions of making space travel as common as taking a plane. Companies like SpaceX, OneWeb, and O3b Networks are making plans to launch the new market of commercial space flight. The jobs generated by these new companies will be numerous and diverse in nature. Private sectors will be able to fill positions in research and discovery that the public sector cannot. They have the possibility of mining material from asteroids, providing space travel to regular citizens, and performing their own research. Each project will employ many that would not have the opportunity to work in space development otherwise. In addition to jobs, the expansion of new markets into space will add a whole new market from which global profit can be made.

If becomes the word that revolves around the development of space. It sums up all of the potential for the human race that lies within the possibilities of space. It provides the opportunity of the collaborative efforts of the globe in sharing and generating knowledge among one another. They are able to develop new technologies and scientific discoveries in the presence of diplomacy. What has already been created is numerous enough; however, what can be created and discovered is almost infinite. The improvement to global health is an extreme promotion for space development. The jobs that will come along with the commercialization and expansion of space development will be enormous. With all of those that have evolved from current research, the expanse of potential to medical discovery becomes almost incomprehensible. Perhaps one of the biggest “*if*’s” of space development is what we can explore within the limitations of the human body. The ability to take ourselves to the final frontier and beyond is the next logical step in the advancement of humanity. No matter the angle that you look at, space development is one astronomical *if*. Humanity has forever been reaching for this ultimate question. Why not explore it now, why wait?

