



# Astrosociological Insights

Newsletter of the Astrosociology Research Institute

Volume 5, Issue 2 - Fall/Winter 2016

**How does *Star Trek* - now celebrating its 50th anniversary – provides inspiration, analogs, and a blueprint reflecting the astrosociological challenges facing both future human explorers in space and the creation of spacefaring societies on Earth and beyond?**

**In other words, what can *Star Trek* teach us about the human dimension of outer space?**

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**Kathleen D. Toerpe, PhD**

Editor

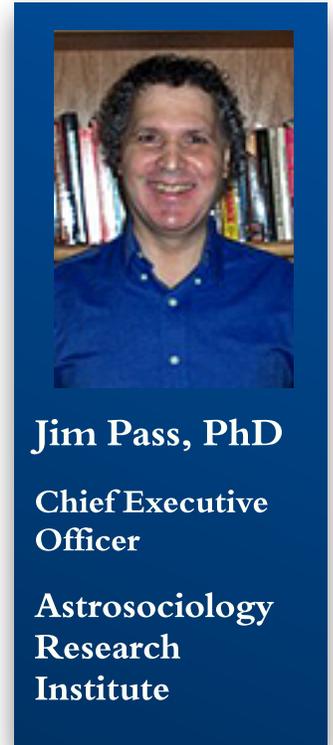
*Astrosociological Insights*

*Star Trek* is personal to many of us. Along with the Apollo missions, the adventures of the *Enterprise* were, for many of us, our first vicarious forays into boldly going beyond our living rooms - and our planet - into a much anticipated future of space travel. Often drawing upon the talents of both established and emerging science fiction writers for its scripts, *Star Trek* - in all its myriad incarnations and reboots - continues to offer a vision of humanity's future in space that inspires, entertains, and emboldens us, while simultaneously often warning us of the pitfalls that lie ahead.

In this issue, our contributors look back at the franchise and start to tease out some of the many take-aways - from the characters, plots, production, scientific underpinnings, etc. - that can be helpful to astrosociologists anticipating humanity's real-life future in space. Our cell phones and computers remind us that at least with *Star Trek*, real life does indeed often imitate reel art. Time will tell if some of the questions we ask today about *Star Trek* will similarly help us to envision and design sustainable human communities in space.

## Notes from the CEO

These observations are dedicated exclusively to the *Star Trek* franchise due to the fiftieth anniversary of the first episode of the *Star Trek* original series (TOS) that occurred on September 8 of this year. ARI continues the editing process on the second volume of the *Journal of Astrosociology* and the *Launching of Astrosociology* book among other exciting programs and projects to be announced as news becomes available. This discussion, which concentrates on the *astrosociological impact of Star Trek*, is important because of its continuing appeal and inspiration that affects viewers from one generation to the next.



**Jim Pass, PhD**

Chief Executive  
Officer

Astrosociology  
Research  
Institute

## The Astrosociological Impact of *Star Trek* on Society

How influential is *Star Trek* to American culture? Back in 1976, the space shuttle due to be named the *Constitution* to commemorate the signing of the US Constitution on September 17, 1787, was changed to the *Enterprise* after 40,000 fans participated in a letter writing campaign that persuaded President Ford to direct NASA to change the name. Purportedly, even the term “shuttle” came from the *Star Trek* original series that called the *Galileo* the *Enterprise*’s “shuttle-craft.” Most recently, the first SpaceShipTwo spacecraft that was constructed by Scaled Composites for Virgin Galactic was named *VSS Enterprise*. Unfortunately, it met with a tragic accident during a test flight on October 31, 2014 that resulted in the destruction of the vehicle and the fatality of one of its two pilots. Perhaps utilizing the spirit of *Star Trek* to some extent, Virgin Galactic has constructed a second SpaceShipTwo and carries on with its mission.

On a personal note, it wasn’t only the Apollo program and Moon landings and other “real” space science and technology events and missions, “hard” scientific literature, or the relatively few influential writings of social scientists focusing on space issues that motivated me to establish astrosociology; I am quite sure of that. The long-term impact of the original *Star Trek* series (1966-1969) provided the foundation from the science fiction realm, adding to the impetus to eventually address the lack of social science input. Moreover, the much later impact from *Next Generation* (1987-1994) and *Voyager* (1995-2001) most notably built on that foundation and contributed to providing me with the inspiration to establish a new social science academic field. I was partial to the social sciences, so I did not become a planetary scientist or aerospace engineer. Instead, I became the first openly declared “astrosociologist” in 2004. The combination of NASA’s space achievements and social scientists’ writings on the one hand, and the science fiction possibilities portrayed in *Star Trek* on the other hand, proved to combine as a strong influence because astrosociology – a field devoted to social-scientific



*The shuttle Enterprise. In 1976, NASA's space shuttle Enterprise rolled out of the Palmdale manufacturing facilities and was greeted by NASA officials and cast members from the "Star Trek" television series. From left to right they are: NASA Administrator Dr. James D. Fletcher; DeForest Kelley, who portrayed Dr. "Bones" McCoy on the series; George Takei (Mr. Sulu); James Doohan (Chief Engineer Montgomery "Scotty" Scott); Nichelle Nichols (Lt. Uhura); Leonard Nimoy (Mr. Spock); series creator Gene Roddenberry; an unnamed NASA official; and, Walter Koenig (Ensign Pavel Chekov). Credit: NASA / Source: [www.universetoday.com](http://www.universetoday.com)*

education and research regarding space-related issues – did not exist beforehand. It had to be invented because almost fifty years of the space age had gone by without adequate social-scientific attention to space issues, or more precisely, to the innumerable effects of astrosocial phenomena on societies around the world.

As the fiftieth anniversary of the first episode of the *Star Trek* original series (TOS) passed us by this past September, we find ourselves at the ever-sliding nexus between the original *Star Trek's* science fiction past and its continuing impact

on humanity's evolving future. Even as various futuristic elements of the *Star Trek* franchise become older, their impact on present-day society and its culture increases due to the ongoing process of various aspects of science and technology catching up to the more sophisticated portrayals of the series' science fiction future. Examples include flip phones, tablets, tractor beams, tricorders, subspace communication, automatic doors, phasers, transporters, universal translators, cloaking devices, food replicators, warp drives, and holodecks. Scientists are actually working on them, and making progress on a number of fronts, and they continue to contribute to social change. Likewise, social and cultural trends are slowly changing toward greater tolerance, inclusion, and economic opportunity; though these societal characteristics remain more elusive than advances in science and technology, unfortunately, and they seem to pale in importance compared to the material culture depicted and assessed by many individuals. Why are we more interested in scientific and technological breakthroughs than those involving other aspects of social and cultural progress? Why are objects deemed more

important than human beings by so many people? More regarding social inequality follows below, but first, a look at the TOS vision of the future.

In contrast to contemporary terrestrial societies, *Star Trek* centers on a future in which everyone on Earth is more likely to cooperate and work together despite centuries of past aggression and discrimination. Ideally, the goal in life in *Star Trek* is to better oneself rather than to seek riches and power at the expense of others in a social reality in which money seemingly does not exist. Beyond that, it also presents a Federation of Planets characterized by a collection of cooperative alien species while other, less friendly, species are fired upon only in self-defense or in protection of the Federation. The protection of non-space-capable societies is a vital consideration.

The Federation even possesses a tool to protect less advanced societies through a doctrine of noninterference. What is the best way to treat less advanced species on another planet or other celestial body? The answer is to implement and try to practice the *Prime Directive* as best as possible. This is difficult, if not impossible, in all cases because real-world scenarios constantly present extremely difficult ethical questions that have good arguments on both sides of the dilemma. Is it a useful tool? There are situations in which the Prime Directive is quite easy to put into practice. For example, avoid a planet with a more primitive level of advancement and place a beacon in space nearby to ward off other ships. But what if a “primitive” culture is advanced technologically enough to destroy itself? What does the Prime Directive dictate? The simple answer is to leave them alone and perhaps study them, but do not interfere. Is this the most ethical course of action? The answer depends on how literally one interprets the Prime Directive. Is it worth having at all? I think the answer is, yes! Humanity could have benefited

***" Is it [the Prime Directive] worth having at all? I think the answer is, yes!" - Jim Pass***

from it on Earth during the multitude of interactions between nations and groups throughout its history. Inequities in scientific/technological levels, as one type of scenario, proved deadly to societies and groups considered “savages” by the dominant group. It is not perfect, but the Prime Directive does attempt to prevent needless harm to less advanced species. When they are considered “ready” and space-capable, Starfleet representatives reveal themselves and ask them to join the Federation.

The impact of *Star Trek* TOS, vis-à-vis its not so subtle defying of the status quo regarding various forms of social inequality such as racism and sexism, represents a topic that is often discussed, and reflected here in this issue of *Astrosociological Insights*. It was vitally important during the 1960s and remains so up to the present day, and it will be important well into the future. While developed societies have made progress in making

## Notes from the CEO (cont.)

opportunities more available for disadvantaged individuals, groups, and categories, their chances for achieving economic success and escaping discrimination on the personal and structural levels are not close to being equivalent to those with power, wealth, and/or prestige. Carrying this social reality into the future, what does this mean for settlements on the Moon and Mars, and elsewhere beyond Earth's atmosphere? We will never attain utopias in extraterrestrial ecosystems, but what lessons can we take with us to reduce the social ills that we currently face? Social scientists and humanists are vital to help answer such questions. They must be included in the planning of missions and other aspects of humanity's relationship with space. With a collaborative structure in place that includes those from both branches of science, we have a much better chance at reaching a level of equality and cooperation closer to that depicted in the various *Star Trek* series.

Specific to space, astrosociology had to be established in an attempt to "force" social scientists and humanists to recognize space and astrosocial phenomena as legitimate areas of education and research, and to recognize the impact of science fiction. The social-scientific approach provides for the possibility of comparative analyses between the spacefaring worlds created by the various series and a particular contemporary terrestrial society at any given time period that can result in important insights as to what aspects are characterized by harmful social and cultural patterns, but also what is possible; a sort of barometer. We are far from that future, not only in terms of where we fall along the spacefaring continuum as a space-capable society, but also regarding the level of integration, opportunity, and equality depicted. In contrast to *Star Trek's* portrayal of inclusion and equality, for example, only approximately eleven percent of those who have flown in space were women. Additionally, only fourteen African Americans have either flown in space or currently have a chance to do so. Compared to the vision of TOS, we have a long, long way to go.

The importance of hard science and technology is indispensable for humanity's future, but it will matter little if the human dimension does not improve along with it. The social scientific aspects of *Star Trek* are discussed, portrayed, and written about undeniably, but not always from a social scientific – or astrosociological – perspective. The so-called "soft" or "harder" sciences study trends in the human condition, but applied astrosociologists will also work to push for certain future outcomes. History has taught us that scientific applications and technologies can be used for good or ill, and we face these dangers today. Thus, socialization, the impact of social groups, in-groups and out-groups, larger cultures, subcultures, social structures, and psychological and social forces on individuals all impact on how history unfolds for a particular society as well as how societies interact with one another; that is, we must understand the outcomes produced by international relations. Even today, we must also think about how interplanetary relations will play an increasing role on how humanity evolves.

## Notes from the CEO (cont.)

*Star Trek* TOS inspired kids to become “hard” scientists, technologists, engineers, and mathematicians, but it failed to inspire them to become “soft” scientists who focused on the impact of science and technology on society to a significant enough level. Likewise, it is interesting and frankly disappointing that existing social scientists and humanists failed to become inspired to study the human dimension of space issues alongside “hard” scientists and technologists. The material was there for members of both branches of science to take advantage, but only one did so. This reality on a more general scale demonstrates why astrosociology is so necessary, and it has a lot of catching up to do. Documentarians and actors recognize the social and ethical trailblazing the original series accomplished, but where was the corresponding interest among social scientists and humanists regarding the impact of such an influential and historic show that examined important cultural values on a weekly basis for three years? Why were social scientists not inspired like the “hard” scientists? These were the issues in the wheelhouse of social scientists, yet they failed to recognize, or worse, take an interest in, the impact of *Star Trek* on society in its myriad of its different facets. Social-scientific issues were raised, but they flew over the heads of most social scientists and humanists.

*Star Trek* consisted of the (mind) melding of science and technology with social science and human interaction. The reciprocal relationship between science fiction and science fact helps to drive progress forward. It is well documented how *Star Trek* devices inspired kids to grow up pursuing STEM disciplines, as discussed. Perhaps less obvious is the impact of real scientific and technological breakthroughs on science fiction writers, providing fodder for extrapolating what future advancements may arise. It is a strong and ongoing cycle. Science fiction writers are constantly exposed to new research and scientific discoveries, technological advancements, and new products and services that arise from them. In turn, science fiction extrapolates upon these advancements to present new ones not yet in existence. These scientific and technological changes also affect cultures and societies. In fact, science fiction stories must also create social structures and cultures and how individuals live under them in addition to the fantastic scientific and technological elements. In contemporary societies, the cycle characterized by the reciprocal interaction between science/technology and society constantly produces social change at the macroscopic level, but this is possible because it also inspires individuals to think in new ways that result in new advancements at the middle and micro level of analysis.

The last *Star Trek* TOS episode aired on June 3, 1969 after only 79 episodes followed by the first landing on the Moon on July 20, 1969, just 47 days later. While there was no overlap, one can guess that this short-lived series created a greater air of enthusiasm to get the job done among NASA and contractor employees. It portrayed a vision of what space exploration could

## Notes from the CEO (cont.)

accomplish, not just for scientific and technological advancement, but also for societal advancement characterized by greater levels of cooperation, equality, and inclusion at a time when “conquering” space (and, figuratively, the Soviet Union) provided some optimism in the midst of social and cultural turmoil. Although positive social change for “minority” groups proved difficult to achieve, cultural and artistic contributions aided the trend toward greater equality.

Whether the future on Earth becomes something closer to a utopia such as in *Star Trek* or some type of dystopia characterized in the *Mad Max* movies and other similar examples of science fiction, it is more likely that astrosocial phenomena will become greater influencers over time leading humanity toward a spacefaring future (though one must assume that it does not spiral off the spacefaring continuum). And, as this process occurs over time, astrosociologists will be there to study how the increasing impact of astrosocial phenomena results in new and evolving features in society due to ongoing social and cultural change, and they will study the reasons behind their existence. How will social structures within societies, and societies themselves, develop as astrosocial change continues, and what will this mean for humanity as a whole as well as social groups and individuals? What social reality will exist when we reach *Star Trek's* seventy-fifth anniversary? Of course, only time – and ongoing astrosociological research – will tell.



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## *Star Trek* and Space Law

One of the fascinations of *Star Trek* is that right from the start, it portrays a coherent and credible background to the interstellar adventures of the characters. Their missions are set in the broadly brushed yet intriguing setting of Starfleet and the United Federation of Planets. One frequent element of the setting that is portrayed is the law and it is surprising that *Star Trek*, a science fiction TV show, includes the law as often as it does. In common with other dramas, *Star Trek* uses legal principles and disputes to bring characters into conflict or to add tension to the plot.

The most prominent law that *Star Trek* presents to its audience is the *Prime Directive*. This guiding principle states that Starfleet officers must not interfere with or alter any alien civilizations below the technological level of interstellar flight, no matter how good their reasons for doing so or how well intentioned they might be. [1]

The beginnings of the Prime Directive are explored in episodes of *Star Trek: Enterprise* (STE). In "Dear Doctor," Captain Archer faces an agonizing decision in which the lives of millions are at stake. Eventually he decides that if he interferes, this would contravene their underlying mission of peaceful communication and exploration. They were not traveling through space to "play God," he decides.

Later, in terms of *Star Trek* chronology, episodes of the original *Star Trek* (TOS) give an idea of how serious the results of breaching the directive can be. For example, "Patterns of Force" depicts an alien world distorted, by the teachings of a Starfleet history professor, into becoming an almost exact copy of Nazi Germany, with appropriately catastrophic consequences.

In the episode "The Omega Glory," Captain Kirk explains that adherence to the Prime Directive is so vital that a captain should be prepared to sacrifice his own life and possibly even that of his crew to ensure it is upheld. Notoriously though, the principle is more often honored in its breach rather than its observance, especially in TOS.

In *Star Trek: The Next Generation* (TNG) and later *Star Trek* series, the Prime Directive is taken more seriously. In "Symbiosis," Captain Picard comments that it is more than just a set of rules: "It is a philosophy," and a very correct one, too.

The stronger application given to the Prime Directive ensures the heightening of the moral dilemmas with which the Starfleet crews have to contend. One of the most shocking examples of the ramifications of the Prime Directive is in the TNG episode "Homeward," in

## *Star Trek* and Space Law (cont.)

which Captain Picard orders that they must do nothing to save an entire civilization doomed by a planetary atmospheric collapse.

The Prime Directive is the most fully developed legal principle that *Star Trek*, in all its TV shows, presents, and the episodes in which it features usually depict a novel twist on its application. This has led to an intricate series of exceptions and modifications in different situations. In the *Star Trek: Voyager* episode "Infinite Regress," we are told it has 47 sub-orders.

The directive first appeared in TOS and it is interesting to consider its origins during the time TOS was created and broadcast. This was a time of almost revolutionary protest among the young in the United States, particularly with regard to the Vietnam War. It is not difficult to conclude that the Prime Directive might have been in part inspired by the hope that non-interference was a more preferable and ethical policy than the unrelenting agony of the Vietnam conflict. More broadly, it can also be seen as reflecting underlying American historical concerns, such as an opposition to colonialism and imperialism and unease with interference in foreign affairs generally, such as the isolationism of the US prior to entry into World War II.

Environmentalism as a movement grew substantially in the sixties, in part due to the accelerating space program and its early images of the Earth as a fragile, natural world without borders. The Prime Directive can be viewed as having an ecological aspect to it as well. The less technologically advanced cultures that Starfleet discovers and the worlds they inhabit can be taken as natural species in ecosystems that are to be respected and valued for their own sake. These parts of the galaxy are to be left alone and not subjugated, colonized, or exploited. Instead they are to be left to develop naturally, albeit allowing for some limited scientific monitoring.

As a life long *Star Trek* fan and someone interested in *space law*, "the body of law governing space-related activities," it has been exciting to compare the Prime Directive and the parts of space law concerning the ownership and exploitation of the rest of the universe beyond Earth. [2] The most important source of space law dealing with these matters is the Outer Space Treaty, enacted by the United Nations in 1967. [3]

What is immediately noticeable here is that TOS, the first *Star Trek* show, and the Outer Space Treaty were both developed and then came into existence at roughly the same time. Like the Antarctica Treaty system that came into force in 1959, the Outer Space Treaty is most importantly a disarmament treaty, outlawing the placing of weapons of mass destruction in outer space. The preamble of the Treaty requires that the exploration of space must be for peaceful purposes, which reminds us of the earnestness of Captain Archer in STE that this be so.

## *Star Trek* and Space Law (cont.)

Article 1 of the Treaty states that the exploration and use of outer space is the province of all mankind. Article 2 develops this further, stating that outer space (which includes the Moon and the planets) cannot be subject to national appropriation by a claim of sovereignty, including by means of use or occupation. Article 9 of the Treaty requires that nation states will avoid harmful contamination of the Moon, the planets, and other parts of outer space when exploring them.

These themes of the peaceful exploration of space, the lack of ownership or property rights in space, and the requirement to avoid harmful contamination combine to remind the more imaginative space law student of *Star Trek's* Prime Directive. This is strengthened when we go on to consider the Moon Agreement of 1979, which sought to expand on a number of the principles listed in the Outer Space Treaty. [4]

Articles 2 and 3 of the Moon Agreement reiterate the requirement that all activities in space are to be carried out in the interests of maintaining peace and for using space for peaceful purposes. Article 7 repeats the requirement on state parties to take measures to prevent the disruption of the Moon and other celestial bodies by avoiding the introduction of adverse changes or harmful contamination. Interestingly, Article 7 goes on to say that state parties shall report any areas on the Moon or other celestial bodies that are of particular scientific interest. This could lead to the designation of such areas as scientific preserves, which will receive special protective arrangements by the United Nations.

The prohibition of any claim of sovereignty or ownership found in the Outer Space Treaty is echoed in Article 11 of the Moon Agreement. This important provision begins by stipulating that the Moon (which is defined to mean the Moon and all other celestial bodies and areas in outer space) and its natural resources are "the common heritage of mankind." This phrase denotes outer space as being a realm that cannot be appropriated by acts of ownership.

Further provisions of Article 11 list additional elements of the principle of the common heritage of mankind. Paragraph 3 of Article 11 states that neither the surface, the sub-surface nor any part of any of the natural resources in place shall become the property of any state, non-governmental entity or any natural person. So, not only is the ownership of land prohibited, so is the ownership of the physical constituents of that land.

This total prohibition on any form of ownership is mitigated by the rest of Article 11's delineation of an "international regime" which seeks to moderate and restrain the exploitation of extraterrestrial natural resources to ensure the common heritage principle is applied. The purposes of this regime include ensuring the orderly and safe development of the natural resources of outer space and the expansion of opportunities in their use.

## *Star Trek* and Space Law (cont.)

The final purpose set out for this international regime is that it shall include an equitable sharing by all state parties in the benefits derived from these resources. This is to ensure that the interest and needs of developing countries (which may not be spacefaring nations) are given special consideration. While the Moon Agreement can be viewed as a failed treaty, as it has not been ratified by a sufficient number of countries, it provides an explication of the Outer Space Treaty's initial outline of the common heritage principle to space.

Although some of the details are different, there can be no doubt that there is a thematic similarity between *Star Trek's* Prime Directive and space law's common heritage principle. Both ensure that an area of concern shall have special protection and consideration. In *Star Trek* this area of concern is those parts of the galaxy that are not inhabited by an advanced technological culture capable of warp flight.

The Outer Space Treaty and the Moon Agreement are of much broader scope. They apply to all areas of the universe beyond the Earth itself. The common theme between the two is that the area of concern is those parts of the universe that are not already occupied by a sufficiently advanced technological society; that is, they are a wilderness that must be preserved, a state of nature that must be allowed to continue, by and large.

One of the most attractive aspects of *Star Trek*, and perhaps one of the reasons that its appeal has lasted so long, is the optimistic, hopeful future it portrays. The Prime Directive is an element of this, as it suggests a more advanced culture that has learned from historical traumas and seeks to act more wisely, with more restraint so as to avoid repeating mistakes of the past. The common heritage principle plays a similar role in space law. It calls upon citizens to look beyond their local, national interests and consider not only all of humanity at present but also the interests of future generations to come.

The drafters of the Outer Space Treaty and the Moon Agreement sought to avoid a scenario referred to by economists as "the tragedy of the commons." An illustration of this, considered in the nineteenth century, involves an area of common land on which cattle may graze. Each herder, acting rationally, would be inclined to add additional cattle to his herd to gain more from grazing on the land. If all the herders do this, in time the land involved would be overexploited, to the detriment of all. This point is of general application in a wide range of contexts, including the oceans, the atmosphere, the seabed, and so forth.

More broadly, the common heritage principle is an attempt to avoid the repetition of some of history's most devastating tragedies, such as imperialism, rampant nationalism, and the vast

***" ... there can be no doubt that there is a thematic similarity between Star Trek's Prime Directive and space law's common heritage principle."***

*- Adam D.A. Manning*

appropriation of natural resources by the militarily and economically dominant cultures of the times. It looks forward to a more progressive time, when the nations of the world cooperate in peace, equity, and in accordance with the rule of law.

It is very farsighted to assign this principle to the realm of outer space. So far, our solar system (apart from the Earth) is effectively free from exploitation and, in practical terms, of an enormous volume. It will take human civilizations centuries to have reached the end point of its exploitation. Yet we are only at the start of this process and no one can correctly predict how quickly technology might advance.

The central problem for space law as it applies to extraterrestrial resources is that it is an unfinished legal regime. As the Moon Agreement was not ratified, the international regime set out in Article 11 was not developed in any more detail or applied in practice. What we need is an equivalent to the Prime Directive's 47 sub-orders! This will take the implementation of the common heritage principle further forward. An example of how this might proceed in practice can be found with the law relating to the exploration and exploitation of the deep seabed, as administered by the International Seabed Authority.

My excitement in learning more about space law, as a *Star Trek* fan, has been discovering just how much of the Prime Directive's farsighted wisdom we already have, bound up in the common heritage principle. As advocates for the settlement of space, we look forward to the greater extension of human society beyond Earth. As this happens, it will be fascinating to see, and even be part of, how the legal regime for outer space develops from the initial principles we currently have into a more detailed and working, practical system.

## NOTES

1. For a detailed exposition of the Prime Directive, please refer to the Memory Alpha website's article, *Prime Directive* at [http://memory-alpha.wikia.com/wiki/Prime\\_Directive](http://memory-alpha.wikia.com/wiki/Prime_Directive)
2. <http://www.unoosa.org/oosa/ourwork/spacelaw/>
3. <http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/introouterspacetreaty.html>
4. <http://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/intromoon-agreement.html>

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## Boldly Inspiring Others:

### Nichelle Nichols - An American Icon

Cue the opening theme music for *Star Trek* – or perhaps the version in which Nichelle Nichols sings the theme! Nichols, well known for her role as Lieutenant Uhura on the original *Star Trek* series (TOS), at first pursued a career in singing and dancing and worked with the legendary musician Duke Ellington. Later, she began work as an actress. Landing the role of Uhura, the communications officer on the starship *Enterprise*, charted new territory in television. Her character was a confident African-American woman portraying a non-stereotypical role as part of an interracial cast. Nichols has said of Uhura: "She'll take no nonsense from anyone, and she is a professional." However, as her part diminished early in the series, she considered quitting and seeking other performing opportunities. It was then that one of the show's fans, Dr. Martin Luther King, Jr., encouraged her to continue, as a significant role model for African-Americans of what was possible for them to achieve.



**Adrienne  
Provenzano**

**Professional  
Musician and  
Educator**

The original *Star Trek* series lasted from 1966 – 1969; however, Nichols' role as an inspiration to would-be space explorers has continued throughout her life. Now in her 80's, she flew with educators on NASA's SOFIA infrared telescope mission on a modified Boeing 747SP in September 2015. This unique plane enables educators to work with scientists and study newly forming stars and other astronomical wonders. Nichols has visited many NASA centers,

including Armstrong, Ames, and the Johnson Space Center. Her affiliation with NASA began in the 1970s and continued into the 1980s as a recruitment ambassador for women and minorities to become astronaut candidates. Among those she recruited to apply was the first American woman to fly into space, Sally Ride, as well as Judith Resnick, Guion Bluford, Ron McNair, and current administrator, Charles Bolden. In addition, while not directly recruited by her, Dr. Mae Jemison, the first African-American female NASA astronaut, credits Nichols' ground-breaking role on *Star Trek* as being her inspiration to become a space explorer.

Another interesting connection between Nichols and NASA occurred when the space shuttle *Enterprise* rolled out of the Palmdale, California manufacturing facility of North American

***"She'll take no  
nonsense from  
anyone, and she is a  
professional."***

*- Adrienne Provenzano quoting  
actress Nichelle Nichols about  
her portrayal as Lt. Uhura on  
Star Trek.*

## Boldly Inspiring Others . . . (cont.)



Actress Nichelle Nichols and Airborne Astronomy Ambassadors pose in front of the observatory telescope during their pre-flight safety training on September 14, 2015. Front from left: Susan Oltman, Michael Shinabery, Jeffrey Killebrew, Nichelle Nichols, April Whitt and Jo Dodds. Back: Ivor Dawson. Credits: NASA Photo / Carla Thomas

Rockwell Corporation (later Rockwell International) in 1976. Nichols was there with many of her *Star Trek* cast-mates for a unique photo-op. The prototype aircraft-spacecraft was never flown into space, but was used for critical approach and landing testing. It was originally to be named *Constitution*, but a massive public letter writing campaign to the White House resulted in the name being changed to *Enterprise*. That craft is now on display at the Smithsonian National Air and Space Museum's Udvar-Hazy Center in Chantilly, Virginia. The modified Boeing 747 it flew on back of – and glided from – is

located at the Houston Space Center.

Several years ago, I had the privilege to hear Nichelle Nichols speak in Houston, Texas at the premiere of an episode of the MAKERS television documentary highlighting women astronauts. I had the memorable chance to meet her briefly afterwards and also observe how delighted others were to meet her in person as well. I found her to be gracious, personable, curious, and dynamic. She greeted each person with a smile and a hearty laugh. A woman of great dignity, Nichols continues to boldly go forward and inspire current and future generations to do the same – bringing NASA and *Star Trek* together in creative ways, hopefully for many years to come. Live long and prosper, Nichelle Nichols!

**Want to know more about astrosociology or the Astrosociology Research Institute? Interested in submitting an article to this newsletter or our peer-reviewed *Journal of Astrosociology*?**

**Drop an email to [ktoerpe@astrosociology.org](mailto:ktoerpe@astrosociology.org) and we will add you to our contact list.**

## Thoughts & Opinions

*Editor's Note: For fifty years, Star Trek has invited us to embrace the utopian possibilities of space exploration, while often cautioning us that our own fears, prejudices, and shortcomings are the real stumbling blocks to creating the just and humane world that we seek, both on Earth and among the stars. In his short reminiscence below, Michael Turner starkly reminds us of how our idealistic hopes for the future can collide with the sometimes abrupt harshness of present reality. - KDT*

### Why I Can't Write About *Star Trek*

I think the last time I saw any *Star Trek* was when I failed to finish watching *Into Darkness*. This was on my flight back from Houston to Tokyo, after the [100 Year Starship Symposium in 2013](#) (100YSS). I turned it off in the middle of the depicted terrorist attack. I couldn't handle it just then.

I still can't.

While I was at the Symposium, [Nairobi's Westgate Mall was attacked by al Shaba'ab](#). Westgate Mall was a place I knew well by then, and frequented by Kenyans I wanted to know better. I'd started quite a few of my Nairobi days over breakfast, on the veranda of a café at Westgate. That was less than two months before 100YSS. I usually visited just to plan the rest of the day with an assistant who drove me around Kenya. In Houston, after I got news of the attack around midnight, I emailed two friends of mine (one of them that assistant). They didn't answer my email for over 12 hours. I spent the next day at 100YSS for lack of anything else to do -- it beat huddling in my hotel room waiting for word. I feared the worst. I had reason to fear. It wasn't statistically improbable. Both of these friends frequented Westgate Mall often enough for my concern to not be overblown.

My erstwhile assistant had, it turned out, been far away. The other friend, however, was stuck in traffic on her way to meet a friend at Westgate, when her mother called her to warn her away. They were safe. But I still had to contend with unbidden imaginings: among those who'd served me at tables and across counters, who had died, in terror, shot in the head after being



**Michael Turner**

Executive  
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## Why I Can't Write About Star Trek (cont.)

unable to recite the required verse from the Koran? Who was now lying unattended in drying pools of blood?

It still affects me deeply enough to ruin a whole day. Today, for example, when I got an email that reminds me of that time.

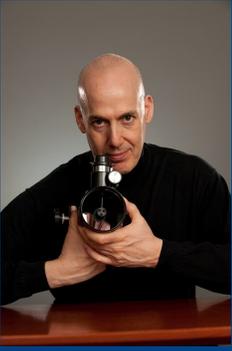
Crouched in economy class, darkness all around me in the passenger cabin, flying into darkness toward Tokyo with the immutable, inescapable roar of jet engines enveloping for the next eight hours, and thinking back on my fresh experiences of the 100 Year Starship Symposium, it suddenly seemed like a silly group exercise in trying to role-play a science fiction novel. I'd contributed a paper to the Civilizations track. Not a single other track participant besides me had taken up the issues like terrorism, insurrection, violent religious extremism, coups, corruption, and the gross inequality that keeps the vicious cycles turning.

There are mutineer movements afoot on Spaceship Earth -- not that it ever had a cohesive crew. These movements get traction only because they are able to play upon real grievances. The idea that grievances could be suppressed in the long run on a large-population starship by adopting some seemingly simple and easily-understood social model (the naval ship, the monastery, the church community, a hypothetical AI-controlled society, even the First Nations tribe) seemed to be the order of the day that year at 100YSS. And from this experience I learned: the space development advocacy "community" is a lot more escapist than *Star Trek*.



*The Journal of Astrosociology, Volume II* is almost ready for release! If you'd like to receive an electronic copy of the *Journal*, send your email address to [ktoerpe@astrosociology.org](mailto:ktoerpe@astrosociology.org).

If you missed *Volume I*, you can read it [here](#).



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## *Star Trek* and the Faster-than-Light Dreams It Inspired

“Warp factor 2” – it’s all over the *Star Trek* universe, and it has become well immersed in popular culture over the last five decades. But what is it, and is it, at least in principle, possible?

Space is vast, very vast, and it takes years, even millennia, for light to travel from star system to star system. *Star Trek* needed a loophole, so that the crew of the USS *Enterprise* could arrive at another star system in time for their next adventure in the following week’s episode. So, they made up just such a loophole, which turned out to be enticingly and serendipitously prophetic – warp drive (the ability to travel faster than the speed of light). This was largely considered to be impossible by most physicists because of Einstein’s Special Theory of Relativity. This 1905 discovery states that neither matter nor energy can exceed the speed of light, and all material objects must travel slower than the speed of light. From this, it appears as though humanity will always be confined to

subluminal speeds, and a *Star Trek* universe could never really be possible; there would be no real-life Zefram Cochrane. [1]

However, while Einstein’s Special Theory of Relativity appears to preclude faster-than-light (FTL) travel, his General Theory of Relativity (the interplay of space, time, and gravity) declares no such FTL proscription. It has been long-established that space itself is solely exempt from the Special Theory of Relativity’s FTL prohibition – space does expand faster than the speed of light. Although an interesting verity to cosmologists because it reveals a lot about the evolution of our universe, it seemed of little practical use for space travel.

Then, in 1994, physicist Miguel Alcubierre found a way, at least in principle, to put a [star] ship into a [space] bottle. He proposed encasing a starship in a fabricated superluminal [bubble of space](#). The enclosed ship would remain at rest within that moving bubble while being carried through the surrounding space, much like a person standing still while on a moving airport “sidewalk” – the sidewalk moves, but the person is stationary with respect to the [sidewalk](#). The principle of warp drive was born. Although Alcubierre had resolved some of the physics of warp drive, the prospect of ever achieving even a prototype of a warp driven starship was about to encounter some insurmountable challenges.

## The Challenges of Producing a Warp Drive

The obstacles to creating a warp driven starship, like the USS *Enterprise*, are numerous and technical. Below are four of those impediments.

1. A warp bubble is formed by compressing the space in front of the ship and expanding the space behind it, much like the flow of air around an aircraft. The *Enterprise* used matter/antimatter reactors [2] to generate its warp drive. In reality, however, a warp bubble could be created only by employing what is called *negative energy*. This strange type of energy does exist. We can make it in the laboratory [3], but only in astoundingly minute quantities. The warp nacelles of a superluminal starship would need to produce negative energy in amounts many orders of magnitude beyond the normal energy budget of our civilization, and then mold it in a warp bubble topology. [4]
2. Incoming radiation (such as sunlight) that strikes the warp bubble from the outside would remove energy from the bubble in potentially huge amounts, thus requiring the warp nacelles to replenish that energy at an even greater rate.

While these concerns may be seen as a “numbers game” that sufficient technology may eventually overcome, a couple of truly fatal flaws in the warp drive theory will likely forever prevent its realization.

3. The warp bubble and the starship would be “causally disconnected” from each other. Therefore, the ship couldn’t communicate with the warp bubble in order to control it, and hence, the warp drive would lack a shipboard on/off switch. Captain Picard’s “Engage!” command could not generate warp propulsion.
4. The combination of compressed space at the front of the warp bubble and expanded space at the back of the warp bubble would create an energy difference that would saturate the interior of the bubble with copious amounts of lethal radiation. Consequently, internal bubble temperatures would be elevated to levels not seen in the universe since around the time of the Big Bang. The ship and crew would not fare well under these conditions!

While *Star Trek’s* prophecy of a warp drive is probably not ever going to be realized, another of its FTL “divinations” doesn’t face all of the theoretical objections confronting the warp drive. There is still hope for a *Star Trek*-envisioned technology that is vastly superior to any warp driven starship.

## Traversable Wormholes

*Star Trek: The Next Generation* was one of many science fiction vehicles to bring to popular

culture the *traversable wormhole* (a “tunnel” through space itself which connects two vastly separated points). A traveler could enter one mouth of a wormhole, necessarily traveling slower than the speed of light so as not to violate the Special Theory of Relativity, and later exit the wormhole’s other mouth. Since the throat of the wormhole (the region connecting the two mouths) is a shorter path, such a traveler could arrive at the other mouth sooner than a light beam that took the longer path. The traveler would have effectively gone faster than the speed of light, but only because he or she took the shorter route and arrived before a light beam that took the “normal” longer route through space.

Traversable wormholes would not suffer from the radiation torrent flooding their insides that would afflict warp bubbles. However, to be held open and allow a ship to pass through, a wormhole also requires negative energy, and an immense amount of it, if it is to be of a usable size and cross a useful distance.

The wider the mouths and shorter the throat desired, the more negative energy that would be needed. Theoretically, with enough negative energy, two points anywhere in the universe could be joined by a wormhole whose throat could be traversed with a single human step. If the physics of traversable wormholes holds up, and if our civilization can ever reach that level of technology, then such a “teleportation portal” would make a trip to anywhere in the known universe as potentially effortless as walking through an open door.

### “Demons of Air and Darkness”

In such a case, our technology would resemble that of the Iconians from the *Star Trek: The Next Generation* episode “Contagion.” In that episode, Captain Picard muses, “Ancient texts did speak of ‘demons of air and darkness.’ Legend has it that they traveled without the benefit of spaceships, merely appearing out of thin air on distant planets.” [5]

Later, when Picard and the away team on the deserted Iconian planet discover a gateway, he continued, “Is this how the Iconians traveled, crossing light years as easily as we would cross a room? Those places could be on worlds in distant corners of the galaxy.” [6]

Furthermore, if some traversable wormholes live up to their theoretical potential to be time machines capable of taking travelers into history, and if someday we could overcome the paradoxes with which such time travel scenarios are fraught, then an entire array of exciting and disquieting prospects is unveiled. Such a traversable wormhole could function very much like Mr. Atoz’s Atavachron from the original series’ episode, “All Our Yesterdays.”

In such scenarios, there would be no need for warp driven starships. Individuals could experience the ultimate spaceflight experience merely by suiting up appropriately for the epoch

and destination, creating a wormhole connecting them to any desired location and era in the cosmos, and stepping through. The bidirectional geometry of a traversable wormhole would allow a return trip whenever desired. In such a culture, adventure wouldn't be limited by imagination; it would likely exceed the most fanciful excursions that the human mind is currently capable of concocting.

## Communication across Interstellar Distances

Current communication prospects are limited by the FTL prohibition that renders interstellar dialogues unreasonable. However, the realization of traversable wormholes would be a game changer. Through a traversable wormhole, messages could be sent from one location to another with near instantaneity. *Star Trek* suggested subspace communication, in which signals would presumably travel by a kind of "electromagnetic warp drive." This prophecy may turn out to be theoretically realizable and to a much greater extent than envisioned in 1966. In fact, with traversable wormholes, packages, letters, and any other material object could be delivered across interstellar, even intergalactic distances by a series of drones, each equipped with a "wormhole generator," a type of "modified Atavachron." A wormhole would be formed, the drone would pass through to its destination, deliver its package, and then create a new wormhole to the next destination, and so forth. There would be no need for unacceptably long waiting times that are unavoidable for radio emanations traveling interstellar distances.

## A Galactic Web

Traversable wormholes would allow human beings to dispense with pretty well every other mode of space transportation. Stepping through gateways and emerging elsewhere in space (and possibly, time, in which disquieting temporal paradoxes would abound) would be nothing less than the conversion of humanity into not only a multi-planet species, but a multi-galaxy species, as our descendants trivially traverse the intervening light years.

The prospect of the near-limitless expansion of humanity throughout the ages and across the known universe would be difficult to envision, let alone quantify. With wormhole technology, people could live and work anywhere and anytime. Independent colonies of human beings and their evolutionary descendants would dwell on thousands of worlds, each one very different from the others and from the mother world. It's easy to foresee entirely independently evolved civilizations culturally and technologically cross-pollinating in the greatest imaginable expanse of humanity.

## The Loss of Privacy & Security

Traversable wormholes, piercing the fabric of spacetime and emerging anywhere, make locking a door utterly futile, since the second mouth of the wormhole could be formed at any location in space, including on the other side of a locked door. It would be speculating beyond the confines of our current understanding of the laws of physics to envision “locking” space around a location so it becomes impervious to the formation of a wormhole. Such a scheme, were it possible and until it was circumvented, would be the only assurance of privacy.

***"The prospect of the near-limitless expansion of humanity throughout the ages and across the known universe would be difficult to envision, let alone quantify." - Jeff Lee***

Furthermore, significant limitations would need to be placed on the distribution of wormhole generators. Cost and technical sophistication may lay the framework for such regulations, as it does with numerous technologies today. It is a terrifying prospect that a megalomaniacal despot might ever attain a traversable wormhole generator and an arsenal of weapons of mass destruction (WMD). Such a person could “FedEx” his soon-to-detonate WMDs to any desired location, and after doing so, immediately close the wormhole. He will have laid waste to his enemies while leaving no trace of the attack’s origin.

## A Long Way to Go

It is not feasible to prognosticate when, or even if, such travels may become possible, let alone routine. Our technology is far too feeble to create wormholes, and our civilization is far too socially and morally immature to cope with their ramifications. For now, it’s probably fortunate that traversable wormholes remain a *Star Trek* wonderment and a subject for theoretical study.

However, if traversable wormholes are theoretically possible, if our technology eventually evolves to that distant future state, and if human civilization matures to the point of handling responsibly this formidable technology, we may realize a “United Federation of Planets” far beyond that through which the USS *Enterprise* warped. We would have become the *Demons of Air and Darkness*.

## Notes

1. The “discover of the space warp,” who first appears in the 1967 *Star Trek* episode “Metamorphosis.”
2. Matter/antimatter reactors are a real prospect and could generate significant propulsion for

a starship. However, the ship's speed, while formidable, would always be subluminal.

3. The Casimir Effect is one method of producing negative energy.

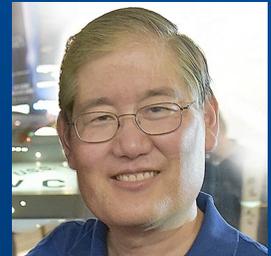
4. Merely forming a spherical warp bubble, 10 meters in diameter and moving at 10 times the speed of light, would require the equivalent of the entire mass of the planet Jupiter to be converted to negative energy (by  $E=mc^2$ ). This is 10<sup>20</sup> (100 billion billion) times the total non-renewable energy used by the world in 2013. Much more energy than that would be

## *Star Trek* and Science Fiction's Predictions of the Future

It's become almost a cliché of science reporting in the popular press. A breathlessly-excited headline announces that scientists have made a breakthrough on a real-life transporter. Or a universal translator. Or some other cool piece of technology that brings the science-fiction world of *Star Trek* closer to reality. Almost inevitably (and often correctly) a reader will point out that while the recent development may represent scientific progress, it probably isn't a step toward the future as envisioned by *Star Trek* creator Gene Roddenberry.

In the half-century since *Star Trek's* first broadcast in 1966, the popular science fiction series and its many spinoff television shows and movies have introduced audiences to a wide range of technological and scientific concepts. From hand-held communication devices, to hospital beds with real-time biomedical monitoring, to a talking library computer system holding the sum of human knowledge, a remarkable range of *Star Trek's* fictional inventions have become reality.

*Star Trek* even accurately predicted, through sheer luck, that the first Apollo moon-landing mission would be launched on a Wednesday. [1] Nevertheless, many of *Star Trek's* predictions have missed the mark by a wide margin. "Space Seed" in the original series (TOS) and *Star Trek: First Contact* suggested that Earth would be in the Eugenics Wars in 1996, then by World War III during the 21<sup>st</sup> century, events that have fortunately not happened, at least not yet. "The Changeling" (TOS), and *Star Trek: The Motion Picture* suggested advanced space probes would be launched from Earth in the late 20<sup>th</sup> and early 21<sup>st</sup> centuries to the outer planets and to extrasolar destinations, missions that sadly have not yet shown up in NASA's budgets.



**Michael Okuda**

**Graphic Designer  
for *Star Trek* and  
NASA**

Other *Star Trek* technological predictions, however, seem even less probable. Physicists often regard *Star Trek's* warp drive as being in contradiction with their understanding of the nature of the universe. Even *Star Trek's* "simple" shuttlecraft, a small single-stage-to-orbit transport vessel, seems firmly beyond the reach of aerospace technology. And while excited articles in the popular press often tout advancements in "quantum teleportation" as a step toward *Star Trek's* transporter, it seems exceedingly unlikely that such a device could ever handle the  $7 \times 10^{27}$  atoms in a human body.

*Star Trek* also postulated a wide range of societies, each different from our own, always with a science fiction twist. While Earth society in *Star Trek's* era was depicted as something of a utopia, war and aggression often characterized many of the strange new worlds discovered by the *Enterprise* crew. The inhabitants of Eminiar VII (in "A Taste of Armageddon") waged a war in which computers chose casualties who then voluntarily committed suicide in disintegration booths, satirizing the sanitized body counts often reported in the news media. The aggressive Klingon Empire was brutal to all who opposed them, reflecting Western views of the Soviet Union during the Cold War. Perhaps most famously, the Borg were a galaxy-wide civilization of cybernetically-enhanced beings whose free will had been lost to an all-powerful collective.

While each of these imaginary societies made for compelling television and film, none were realistic concepts. They're not meant to be. They're all allegories for issues facing present-day society, and in that regard they're both powerful and important.

And while a transporter may forever remain out of the reach of real-world engineering, there's no denying that *Star Trek's* stories have helped to inspire cell phones, computers, translation systems, biomedical instrumentation, and more.

Here's the thing: *Star Trek* doesn't predict the future. That's not its job, nor is it the job of those who bring Gene Roddenberry's vision to the screen. *Star Trek's* job is to entertain. However, in the process of delivering such entertainment, *Star Trek* also tells stories of possible human futures, illuminating the effects of possible trends in our society, both positive and negative. These have sometimes been harsh warnings of the dangerous effects of such things as war or racism, but they have also been soaring depictions of a society in which we have learned to value our diversity and in which we have reaped the benefits of science to improve life on Earth and literally reach for the stars.

It is through this lens that I choose to see *Star Trek*. The show doesn't predict the future. Rather, Gene Roddenberry's vision *inspires* the future.

## Notes

1. The 1966 original series *Star Trek* episode, "Tomorrow is Yesterday," written by D.C. Fontana, showed the *Enterprise* traveling back in time to Earth's 20th century, where the ship's crew monitored a news broadcast about the upcoming first moon landing mission to be launched "next Wednesday." Apollo 11 was not launched until three years later, in 1969.

Michael Okuda was the lead graphic designer for most of the *Star Trek* television series and movies. He has also designed numerous mission and project emblems for NASA including the STS-125 Hubble Telescope servicing mission of space shuttle *Atlantis*, and has been honored with NASA's Exceptional Public Service Medal. Okuda is also coauthor of the *Star Trek Encyclopedia* and has served as a technical and scientific consultant to the *Star Trek* writing staff.



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## Fifty Years on the Final Frontier

It may be difficult to look back with clarity at the beginnings of *Star Trek* from the vantage point of our present, whose cultural underpinnings the show – and its many later incarnations – crucially contributed to shape. Today, elements of the rational humanism informing Gene Roddenberry's vision can be found in other TV shows and movies, in novels and comics, in the lives of the thousands of professionals in spaceflight-related areas who have openly credited *Star Trek* with inspiring them to take those paths in life, and in the parlance of a collective sensibility that has half-consciously embedded linguistic expressions, imagery, and tropes from the show(s) into its everyday transactions.

And *Star Trek* is still with us, of course, now metamorphosed into yet other incarnations inside movie theaters and, very soon, television – for the sixth time. Still with us are also the novels, video games, comics, short stories, fan fiction, and fan art that have transformed Roddenberry's dream, over the past fifty years, into a plurality of voices foregrounding a fictional universe more vivid and real-seeming than many socio-economic realities on Earth today.

Sociologists, astro- and otherwise, will probably remember *Star Trek* as the first serious attempt to portray for a mass audience a viable blueprint for a better future. In this sense, it's probably

hard for us today to understand how revolutionary that attempt was. In 1966 we didn't even know it was physically possible to go to the Moon, let alone develop warp-drive capabilities and form a galactic commonwealth based on the peaceful interaction of equal partners. There were few actors and actresses of races other than white Caucasian in Hollywood, and those few had never been cast in leading roles. That an African-American woman should appear on the bridge of a (star)ship as communications officer, that an Asian-American man should play the role of this ship's pilot, and that a Russian character should appear on the TV screens of Cold War America as the captain-in-training – all this was unheard of, and it certainly attracted as much censure as it did approval. But *Star Trek* kept traveling.

The show wasn't always as good as it could have been. Many episodes either broke or flat-out ignored the very premises that should have informed their plotlines. Uhura often became a helpless damsel in distress, Sulu and Chekov mere functions of the ship's systems, and Kirk just another alpha male on top of a nebulously portrayed hierarchy. In fact, there's reason to believe that, at least in the case of the original series, the failures outnumbered the successes.

But the successes were magnificent. In those moments, the cast and crew of the *Enterprise* became wise and powerful, strong without violence and eloquent without arrogance. They played by rules created to do much more than just pay lip service to a pervasive concept of civilization, and ultimately it's those very rules that have been keeping viewers coming back for the last fifty years. Today as in 1966, they matter a lot.

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## A Celebration of *Star Trek*: DePaul University - May 2016

*Editor's Note: I presented at this conference and was thoroughly impressed by the range, depth, and warmth of the dialog between the panelists and the audience. Not a fan event and not a traditional academic conference - but something engagingly combining the best of both! It was at this gathering that I decided upon the theme of this issue of **Astrosociological Insights**. - KDT*

May 07, 2016 saw over 200 *Star Trek* fans and scholars come together for a one-day celebration of the program, in honor of its 50th anniversary. DePaul University's Media and Cinema Studies program (along with the American Studies program, the Digital Communication and Media Arts program, and the School of Cinematic Arts) hosted the event, with speakers Brannon Braga (writer and executive producer of more than 300 episodes of the *Star Trek* series—for over 13 years he worked on *The Next Generation*, *Voyager*, and *Enterprise*, and wrote the



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**DePaul University  
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films *Generations* and *First Contact*), Lisa Klink (a writer who started her career in the world of *Star Trek*, writing for *Deep Space Nine* and *Voyager*), and academic Dr. Lincoln Geraghty (author of *American Science Film and Television*, *Living with Star Trek*, and *Cult Collectors*).

The event was the fourth annual “Pop Culture Conference” at DePaul University’s Loop Campus. Each Pop Culture Conference aims to bring fans, scholars, and community members together to have insightful and engaging conversations in honor of a single media object’s anniversary. Previous topics include “A Celebration of *Doctor Who*” (2013), “A Celebration of Joss Whedon” (2014), and “A Celebration of *Supernatural*” (2015). Each conference is free and open to the public. The well-attended keynote panels at “A Celebration of *Star Trek*” brought new insight into this fifty-year old program. Mr. Braga spent an hour with a question and answer session, thoughtfully discussing aspects of his time on the show. He answered questions about the production process, his involvement with the films, and some of his inspirations, among others. Ms. Klink discussed both her time writing for the two *Star Trek* series, *Deep Space Nine* and *Voyager*, as well as giving particular tips as to becoming a writer in Hollywood. Dr. Geraghty discussed the enduring myths of *Star Trek* and how it encapsulated – and continues to encapsulate – American culture.

Another well-attended and engaging lecture at the event was the Leonard Nimoy Tribute by sociology professors John and Maria Jose Tenuto. Their moving discussion of Mr. Nimoy’s contributions to *Star Trek* and other popular culture texts brought new insights into the icon.

In addition, each year raises money for a particular charity, usually nominated by one of the Keynote speakers. “A Celebration of *Star Trek*” raised over \$1200 for Chimp Haven, a group dedicated to rehabilitation and resettlement of chimpanzees.

Other panels at the event, with over 50 speakers represented, included: IDIC: Philosophy and *Star Trek*; The Federation: Politics and *Star Trek*; Through the Wormhole: Reevaluating *DS9*; History of the Klingon Empire; The Cultural Impact of *Star Trek*; Trekkies, Trekkers, and Beyond: Fandom of *Star Trek*; Learn Klingon; *Star Trek* and Gender; LLAP: The Future According to *Star Trek*; Canon, Fanon, and In-Between: *Star Trek* Fan Works; Generations of *Trek*: Film, TV, and the Evolution of *Star Trek*; Debating the Future: Otherness and Privilege in *Star Trek*; Klingon: A Case Study of Conlangs in Mass Media; Beam Me Up: *Star Trek* Performance; The Future is Here: Science and Technology in *Star Trek*; Klingon Christmas Carol; Teaching *Trek*: Pedagogy and *Star Trek*; Queer Identities in Cosplay and Fandom. One fun and unique panel held at the end of the day was the Fantasy Draft Crew! panel, where panelists used a fantasy-football-style draft to bring different members of *Star Trek* crews together and have discussions about how they might react in hypothetical situations.

The Pop Culture Conference has proven to be an exciting one-day event that brings different groups of people together to share their love and appreciation (and criticism) of a piece of media. It includes both academics and fans as panel speakers to attempt to create links between fandom and academia—two groups that engage in very similar practices, even if they do so in different ways. Panels are slightly more intellectual than the average panel at a fan convention and they are slightly more engaging than those at scholarly conferences—the Pop Culture Conference aims for thoughtful discussion rather than reading scholarly papers.

Next year's Pop Culture Conference is focused on the *Harry Potter* series, in honor of the 20th anniversary of the first publication of the first book. It will be held at the DePaul University Loop campus on May 6, 2017.

More information about this conference can be found on the website

<http://www.mcsdepaul.com/depaul-pop-culture-conference.html> or on the Facebook page

<https://www.facebook.com/DePaulPopCulture/>. The Twitter handle is @DPU\_PopCulture.



**Jason D. Batt**

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## What To Do with Wesley: The Question of the Invention of Adolescence

The question of what to do with Wesley Crusher received a sharp and decisive answer in the *Star Trek: The Next Generation* (TNG) episode "Datalore" when Captain Picard provides a furious command, "Shut up, Wesley!" Potentially, a multitude of fans heard their own sentiments given voice at that moment. Wesley's role was immediately disliked by fans and the reasons given are numerous: "annoying," "undeserving," and "awkward" start the list. Wesley stood out, initially, due to being one of the few TNG characters without an equivalent TOS role. Data filled the analytic shoes of Spock. LaForge was the new engineer to take Scotty's spot. Down the line, the new *Trek* was unique but echoed the original. Except for Wesley. Wesley was a teenager aboard a ship that had been, for most of its broadcast history, built upon military structure. Those first viewers found themselves wondering, "A teenager aboard a starship? Why?"

*Star Trek: The Next Generation* added much to the canon of *Star Trek* and expanded the vision of what a crew should be. The *Enterprise* no longer strictly resembled the navy vessels and structure that The Original Series patterned itself upon. Now, entire families lived aboard the

## What To Do with Wesley . . . (cont.)

ship. There were schools filled with kindergartners and families had new children as the series ran through its seven seasons. The introduction of an on-board counselor—a member of the command crew, no less—reinforced the reality that TNG was about humanity traversing the stars and not just the elite, military-like individuals of TOS. If TOS resembled the military fleets of the Pacific campaign, and imagery seen within Robert Heinlein's many novels, TNG reflected the potential of generation ships traveling to the stars, even if that comparison was unintentional. The *Enterprise* NCC-1701-C carried all of our world as it ventured into that new frontier.

Wesley Crusher was the first recurring child character in *Star Trek* history, although he would be followed by others, most notably *Deep Space Nine's* Jake Sisko. Wesley's initial inclusion seemed to buoy the reality that the *Enterprise* was a representation of all of humanity. As well, his time on the show coincided with the direct management of the series by Gene Roddenberry—Wesley's exit came soon after Roddenberry's own distancing from the show due to health reasons. Roddenberry remarked that Wesley was built upon his own adolescent self and became a proxy for Roddenberry on the show. [1]

Yet, as the show developed, Wesley's role in his limited time on the *Enterprise* gradually evolved to being a potential "Chosen One." An entertainment trope, "The Chosen Ones" are often "the only ones capable of resolving the plot . . . [and] that these characters are held in esteem for their expected potential." [2] Over the course of the show, there were seven times that Wesley, "'who [had] trouble getting into the Starfleet Academy,' and is on a ship 'filled with Starfleet's best and brightest crew members,' [came] up with 'the needed solution.'" [3] In the episode "Where No One Has Gone Before," Wesley discovers the reason the *Enterprise* has been cast over two million light years from their previous location. After being ignored, it is revealed that the character responsible, The Traveler, discovers affinity with Wesley and notes that the adolescent is special like himself with advanced intellect and potentially magical abilities.

The fandom, or at least a vocal minority of it, despised Wesley. One blog addresses Wesley directly in a personal letter to the character:

You are, by far, one of the most annoying characters in the entire *Star Trek* Universe. Ok, sure, you have a few close runner-ups (Neelix, Lwaxana, Keiko, Alexander) but I'd still say you take the prize. You are an obnoxious know-it-all kid who had a tendency to screw things up, whether it be by appointing yourself 'acting captain' and taking over engineering, letting nanites loose to destroy the ship, lying at Starfleet hearings, or getting a death sentence on a foreign planet. We're talking second only to *Star Wars'* Jar Jar Binks level of annoyance." [4]

## What To Do with Wesley . . . (cont.)

The writer continues to prove this through an analysis of episode ratings from IMDB data. Those few episodes with Wesley Crusher in appearance score distinctly lower than those without. More so, the ratings decline within those episodes with the more lines of talking Wesley has.

Perhaps this hatred also came from the show's confusion of what to do with Wesley. At first, he was nothing more than the on-board son of the acting physician, Dr. Beverly Crusher. The show recognized that they had to do something with him and gradually brought him further and further into storylines. Perhaps to justify the inclusion of a young, unexperienced addition against the seasoned crew of the *Enterprise*, they chose to explore his potential and thus, fell into the standard trope of the Chosen One.

It's not by coincidence that most Chosen Ones are adolescents. Harry Potter, Luke Skywalker, Eragon, Frodo Baggins [5], Katniss Everdeen, Ender Wiggins, among others. The role of the Chosen One within literature hints at their untapped, undiscovered potential at some point in the future. Children and adolescents are ripe with potential—their futures are yet unwritten and, as parents are often keen to say, they can become anything they want. In a way, parents often view their children as potential (if non-magical) Chosen Ones—untapped greatness just waiting to be discovered or explored. The ramifications of these expectations when unmet aren't within the scope of this writing but have implications on future family dynamics.

More so than being a Chosen One, Wesley's role on the starship extended that theme of humanity among the stars in an unintended way: the role of adolescents in society. The writers inserted an adolescent and his time on camera proved they didn't know what to do with him. Equally, within the story, the crew itself struggled what to make of the adolescent in their midst. This fumbling isn't entirely surprising, though—adolescents, or at the least the concept of adolescence, is a recent invention.

From a sociological perspective, the concept of adolescence has developed over the last few decades rather than centuries. Ben Cosgrove, in *Time Magazine's* look back at *LIFE Magazine's* turn-of-the-century photo expose on adolescence, writes:

Historians and social critics differ on the specifics of the timeline, but most cultural observers agree that the strange and fascinating creature known as the American teenager — as we now understand the species — came into being sometime in the early 1940s. This is not to say that for millennia human beings had somehow passed from childhood to adulthood without enduring the squalls

of adolescence. But the modern notion of the teen years as a recognized, quantifiable life stage, complete with its own fashions, behavior, vernacular and arcane rituals, simply did not exist until the post-Depression era." [6]

This timeline gives us less than a century with the solidified idea of adolescents. John and Virginia Demos, in their paper "Adolescence in Historical Perspective," extend that timeline slightly: "Yet all of this has a relatively short history. The concept of adolescence, as generally understood and applied, did not exist before the last two decades of the nineteenth century. One could almost call it an invention of that period; though it did incorporate, in quite a central way, certain older attitudes and modes of thinking." [7] They provide the following as evidence: "An examination of various written materials from the period 1800-1875 uncovers (1) almost no usage of the word and (2) only a limited degree of concern with the stage (and its characteristic behaviors)."

[8]

Yet, today, the concept of adolescence is a given—the period of development seems absolutely concrete and unquestionable. In *Psychology Today's* article "The Invention of Adolescence," the authors assert that "The study of adolescence has come with a context—a culture of, by, and for youth, arising in the postwar boom of the 1950s and epitomized by James Dean. Once the original badass depressive teenager from hell, Dean seems quaintly tame by today's standards. But the fear and loathing he set in motion among adults is a powerful legacy today's teens are still struggling to live down." [9] Set within the framework of *Star Trek*, a recent societal invention struggles to find its place. *Star Trek: The Next Generation* starts in the year 2364 A.E. The fiction projects ahead over three centuries and installs a character whose cultural role is less than a century in development. No wonder Wesley Crusher never grew into a constant, contributing crewmember.

*"... Wesley's role on the starship extended that theme of humanity among the stars in an unintended way: the role of adolescents in society."*

*- Jason D. Batt*

In a way, Wesley's role bridged the predominant view of teens throughout history with the latter-day one. "Historically, children never lived at home during the teen years, points out Temple University's Laurence Steinberg. Either they were shipped out to apprenticeships or off to other relatives." [10] Crusher's only route is to be both a stay-at-home child, journeying with his mother, and also an apprentice to Engineer Geordi LaForge and, at distance, Captain Jean Luc Picard. Part of the difficulty in deciding what do with adolescents is the shifting

nature of the stage:

Paradoxically, puberty came later in eras past while departure from parental supervision came earlier than it does today. Romeo and Juliet carried the weight of the world on their shoulders—although it was a far smaller world than today's teens inhabit. Another way to look at it is that in centuries past, a sexually mature person was never treated as a 'growing child.' Today sexually mature folk spend perhaps six years—ages 12 to 18—living under the authority of their parents. Since the mid-1800s, puberty—the advent of sexual maturation and the starting point of adolescence—has inched back one year for every 25 years elapsed. It now occurs on average six years earlier than it did in 1850—age 11 or 12 for girls; age 12 or 13 for boys. Today adolescents make up 17 percent of the U.S. population and about a third of them belong to racial or ethnic minorities. [11]

Even today, the limitation of adolescence is in flux. In the last few years, a flood of articles have been published discussing the concept of “delayed adolescence.” Of note, is the trend for individuals in their early-twenties to still be fulfilling the role of the “teenager”: living at home, limited job opportunities, limited education, and limited responsibility. NPR interviewed developmental psychologist Larry Nelson of Brigham Young University regarding a study published in *Journal of Family Psychology*: “Nelson surveyed 392 unmarried college students and at least one of their parents. ‘We wanted to know if parents considered their child —18 to 26 years old — adult or not . . . Over 80 percent of mothers and fathers said, ‘No. They are not yet an adult.’” [12] In less than a century since its origin, the definition of adolescence is still being decided by society at large. It is impossible to expect the writers then to answer the question of adolescence when we are still learning what the question is.

Wesley’s uncemented role in *The Next Generation*, perhaps accidentally, reflected the real societal conversation of the role of adolescence. Wesley was age 16 in the first season and was 18 when he took the role of Ensign aboard the Bridge. By the rising age of adolescence today, Wesley was an outlier, surpassing what would be expected of today’s teens.

Wesley's confused portrayal is highlighted against the other significant recurring adolescent character in *Star Trek* lore: Jake Sisko. Jake was the son of *Deep Space Nine* commander Benjamin Sisko. The show itself, a direct spin-off of *The Next Generation*, shifted the tone of *Trek* to a far more realistic, less-episodic nature. Jake’s role was longer lasting than that of Wesley. Jake continued to a constant role through all seven seasons of DS9. In the first season, he is age 14 and still in school. Like Wesley, he has lost a parent—his mother. Jake never fell into the role of the Chosen One. The writers portrayed him going to school, having adventures,

breaking rules, and getting into trouble, along with exploring his spirituality and his future career. [13] Ultimately, Jake chose the career of a reporter and embedded himself among an occupying force when the station was invaded. As the series wraps, Jake has become a saboteur experiencing the challenges and horrors of war first-hand. While an evolving character arc, his role reflects modern-day expectations of adolescence: learning, mischief, exploration, and ultimately, grasping the challenges of adulthood. Less than five years separate the appearance of Wesley Crusher in *Trek* lore with the appearance of Jake Sisko. With the entertainment failure of Wesley, perhaps the writers would have been leery of introducing another adolescent constant, yet, they did so and from the warm reception within fandom, seemingly succeeded.

So, is the question of adolescence solved with Jake? Perhaps. As well, the two might be seen as equal portrayals of our current society's presumptions of adolescence: first, with Wesley, the potential for a limited future, and then, with Jake, the path of normal maturation. Of interest, is that since the pair's appearances, *Star Trek* has avoided the challenge of adolescence as a mainstay among their crews. *Voyager*, *Enterprise*, the TNG films, the recent years' reboot of the original series – all are absent of adolescence.

Yet, this might reflect *Star Trek's* continual appreciation among our culture. It both reflects modern thought and still challenges us. Wesley is notable in *Trek* lore—while potentially disliked he was among the more recognizable crewmembers from TNG as were Geordi, Worf, and Data. Ultimately, the writers chose to let Wesley's unwritten potential be his ultimate path. Wesley leaves the *Enterprise* to travel the stars with the alien Traveler, to discover new planes of existence, and in a way, extend the mission of *Star Trek*, and, likewise, the promise at the edge of adolescent hopes: to explore strange new worlds of the frontier.

## Notes

1. "Wesley Crusher." Memory Alpha. [http://memory-alpha.wikia.com/wiki/Wesley\\_Crusher](http://memory-alpha.wikia.com/wiki/Wesley_Crusher). Accessed November 5, 2016.
2. "The Chosen One." *TV Tropes*. <http://tvtropes.org/pmwiki/pmwiki.php/Main/TheChosenOne>. Accessed October 30, 2016.
3. Farrand, Phil. "Updated Conundrum Tote Board" *The Nitpicker's Guide for Next Generation Trekkers, Vol. 2*. New York: Dell (1995): 319.
4. "Wesley Crushes Ratings." <https://datascopeanalytics.com/blog/wesley-crushes-ratings/>. April 19, 2016. Accessed November 2, 2016.
5. Admittedly, Frodo was 33 years old—a fact that puts him outside of the normal range of adolescence. Yet,

## What To Do with Wesley . . . (cont.)

within a culture whose senior members are far past 100 years old, he is still considered an adolescent in their community.

6. Cosgrove, Ben. "The Invention of Teenagers: *LIFE* and the Triumph of Youth Culture." *Time Magazine*. September 28, 2013. Accessed October 28, 2016.

<http://time.com/3639041/the-invention-of-teenagers-life-and-the-triumph-of-youth-culture/>.

7. Demos, John, and Virginia Demos. "Adolescence in Historical Perspective." *Journal of Marriage and Family*, vol. 31, no. 4, 1969, pp. 632–638. <http://www.jstor.org/stable/349302>.

8. Ibid.

9. "The Invention of Adolescence." *Psychology Today*. January 1, 1995. Accessed October 10, 2016.

<https://www.psychologytoday.com/articles/199501/the-invention-adolescence>.

## In Space, No One Can Hear You Scream - But Everyone Can See You Cry

Space, in all its beauty, is isolating, cold, and unforgiving. The journey of getting to another planet requires individuals to have the skills and ability to maintain mission activities, but also the emotional intelligence to manage themselves and relationships with others. This may be one of the most difficult challenges of space travel – me, you, and us. Without the ability to manage relationships, individuals and crews will suffer both mentally and physically. While relationships, both platonic and romantic, are part of everyday life, during space travel they take on even more importance.

*On the relationship side, if you teach people to respond actively and constructively when someone they care about has a victory, it increases love and friendship and decreases the probability of depression. – Martin Seligman, psychologist*

Relationships are hard – period. In space, they are even harder. A relationship has exponential impact on the emotional environment of a crew. Difficulties exist when trying to avoid other people when things go awry or running into constant reminders of circumstances, both good and bad, are omnipresent. *Star Trek*, while giving us an inside view of the possibilities of space exploration, also provides a reflection of ourselves as humans. Gene Roddenberry took away the social barriers that hindered people on Earth



**Aires Almon**

**Orchestrator of  
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100 Year Starship**

and created a social environment that focused on idyllic societal norms. Each episode created a thought problem that typically was societal in nature. In the original series (TOS), the crew of *Star Trek* itself was a provocation –If race and gender were all neutral, what kind of relationships could be formed, could we actually work together and judge each other on our contributions and abilities? The answer is yes, we can; however we are still human beings with all the flaws and frailties that the human condition entails.

*Nothing is perfect. Life is messy. Relationships are complex. Outcomes are uncertain. People are irrational. – Hugh McKay, Canadian politician*

As optimistic as *Star Trek* presented itself, we learn that we can still get in our own way. Male/female relationships can be fulfilling and awkward. In *Star Trek: The Next Generation*, we follow the ever-evolving relationship between Counselor Deanna Troi and Commander William Riker. On the ship, they are colleagues and friends, who care deeply for each other. This presents a known “relationship” for the crew, which is watched and managed by everyone that is in their inner circle, which happens to be the whole crew. Everyone is “in their business” so to speak. Privacy is lost on a space mission, as is shown in analog Earth isolation, submarine, and Arctic mission studies. With space travel, few places are available where a person can go to deal with their feelings in private. As we prepare for travel to space, the need to balance privacy with support will be crucial. No one wants to be viewed as “weak”; even though emotions are part of everyday life, the perception of weakness in one member can isolate an individual and damage a team’s morale. If the crew can accept changes in emotion as part of their everyday existence, then the impact of an “off day” can be minimized.

*We think, each of us, that we're much more rational than we are. And we think that we make our decisions because we have good reasons to make them. Even when it's the other way around. We believe in the reasons, because we've already made the decision. – Daniel Kahneman, cognitive psychologist*

Space can make you run into yourself, not in the way of looking in the mirror or bumping into an emotional twin. Embarking on the exploration of the unknown, often there are anomalies that come to life. Uncertainty becomes a reality over and over. In “Parallels,” an episode of *Star Trek: The Next Generation*, Lt. Worf runs into a problem where he is sliding between different realities. It turns out he has broken the barriers between different realities. The interesting part of this episode is the direction of relationships that have formed based on certain decisions that were made either by Lt. Worf or by circumstance. In one reality, he had been promoted to first officer due to the fact that Captain Picard has perished in a battle and is no longer on the *Enterprise*. In another reality, he is married to Counselor Troi, and he has

two children in the marriage. It is fascinating that unique space conditions gives one the opportunity to see the outcome of the decisions that one makes in life. We only know the reality we live in, but through quantum mechanics those choices we did not make still exist and the possibility of choosing one reality over another can be tempting. The possibility of discovering that our theoretical assumptions are true creates a real conundrum. How would we act knowing that we could exist between all of our choices and then follow the best path?

The *Star Trek* universe continues to reveal not only the possibility of scientific achievement, and triumph of the human spirit, but also the realities of human frailty. While not a fairytale, the lens of *Star Trek* allows us to see ourselves for who we are and not just an idealized, unflawed society. The temptations of space mechanics and technology are not enough to stifle our human nature. It is those flaws that make humans real and enable our ability to survive in the isolating beauty that is space.

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*Next issue: Spring/Summer 2017*

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