

The Case for Planetary Awareness

How the New Space Age will Profoundly Change Our Worldview



The False Dichotomy between Space Exploration and Saving the World

A long envisioned New Space Age is beginning... at the very time that the world is consumed by a perfect storm of crises that threatens the very sustainability of civilization. To say that we are at a turning point in world history is a vast understatement. Our scientific and technological



capabilities are expanding at a geometric rate, but the human mind and society resist such rapid change.

An important example is the seeming dichotomy between the futuristic, science fiction-inflected vision of space travel and our immediate



concerns for the future of the world. Many advocates working on solutions to problems in the environment, international conflicts and a host of humanitarian challenges view expensive and risky human space programs, as a diversion of resources from these urgent Earth-based concerns - making these “world-change” activists among the most vocal critics of human space efforts.

But it's a false dichotomy! The missing piece is the profound *space-induced shift in worldviews* described by the majority of astronauts since the beginning of spaceflight. Frequently these shifts sensitized them to many of these very same crisis issues. Widely known in the space community as the *Overview Effect*, it is little known by the general public and poorly understood even by many space advocates.



World-change activists repeatedly say that gaining a global perspective and worldview is essential to creating solutions to world-scale problems, and that helping people gain such a perspective is one of their first *and most difficult tasks*. Yet astronauts talk of gaining such

perspectives *just by seeing the Earth from space*. NASA and cultural histories record that even just the words and pictures of the Apollo Program jump-started the modern environmental movement, energized various international peace and conflict resolution efforts, as well as engendered a growing sensitivity to humanitarian issues around the globe.



Seeing the Earth in the universe for one's self, changes the space traveler's understanding about many aspects of life on Earth, *changes in worldview closely parallel to those long advocated by world-change leaders*. Yet despite decades of astronaut experiences, we as a culture know virtually nothing about them. *Why is this Overview Effect not already part of the cultural debates over the value and purpose of space programs as well as our major global challenges?*



The Birth of a New Space Age

These questions might be of little other than to space enthusiasts, if not for the fact companies such as Elon Musk's *Space X*, *Bigelow Aerospace*, *Orbital ATK* and others are increasingly capable of achievements in space that just a few years ago were the sole province of nation-states, and they are dedicated to creating a space-faring, multi-planetary civilization within the this generation.





Others, such as *Virgin Galactic*, *XCOR* and *Blue Origin*, so called “Space Tourism” companies, will soon begin taking



thousands of passengers for short flights into space, bringing the potential for this worldview shift to tens of thousands of private citizens and a new perspective on life on planet Earth for the rest of us.

This can be an extremely effective and urgently needed way to instill in our culture the same sort of concerns about our current world challenges that the astronauts experience, *and all the related implications that provide valuable insights into a sustainable world*. And for billions of others, *Overview*-infused content for a variety of emerging virtual reality and new more realistic and immersive media technologies have the potential to give them a far greater taste of the *Overview* experience than can any commercial media to date.



Why Do We Not Already Know This?

But first we should understand why we don’t already know of this profound experience, despite decades of astronaut reports. Much of this disconnect is because the *Overview Effect* , while clearly a space experience, is *primarily a psychological issue*, best explained by cognitive (brain/mind) perception research. And the fact that all the space media imagery we see does not give us the experience of direct perception is due to the nature and limitations of current media. Unfortunately, none of these fields are in the usual space industry “tool box.”



Next we have to understand “worldviews” and their role in our lives. The idea that we all have a nexus of often unconscious memories, accepted knowledge and beliefs that underlie our conscious thoughts, choices and behavior has long been studied in multiple fields.



**What is your
Worldview?**

Finally, we have to look at the culture of the space community to understand why its leaders, many of whom know a lot about the space experience, are not making every effort to explain these important ideas to the public.

While little cognitive research has been done on the astronauts, there *is extensive* research on other extreme

sensory experiences that induce similarly profound shifts in one's mental framework and perspective. In various fields these changes are variously referred to as *paradigm* or *worldview* shifts. Such research reveals that the space experience creates a fundamental change in the space travelers' mental frameworks, paradigms or worldviews, simply from seeing *the reality of the fact that we live on a planet, a reality I've termed, Planetary Awareness!* The dual mystery of the space experience is first, how and why this simple view has such an effect on the mind, and second, with all the Earth and space media we have seen, why we get such a limited version of the *Overview Effect* ourselves?



First let's look at some of the curious and resonant statements of the astronauts. The few presented here can give you only a glimpse of the breadth and depth of the space experience as revealed in hundreds of their reports.

The Reports of the Astronauts on their Space Experiences - Three major Categories

While not every astronaut expresses all the same implications of the *Overview* experience, we have found three categories that are most frequently reported. These are: **1) environmental sensitivity and concern for the evident fragility of the planet;** **2) concern over international conflicts, which are often felt as a great contrast to life on a tiny, fragile planet in a largely unknown universe;** and **3) a variety of humanitarian concerns, once the population is seen as sharing this small, fragile, highly interactive and conflict-ridden planet.**



"...you do get a different view of the planet... [Your current view is] based on your own experience. And there's a big difference between knowledge you gain just from intellectually learning it and knowledge you gain from experience...It's incredible how it hits you...your view of the planet changes at that point. You see it as...no kidding...a spaceship. You see it as one integrated system...When you see the planet the way... [we] did, it really does change your view." - Astronaut Sandy Magnus, speaking at the Smithsonian's National Air and Space Museum

"I guess you would call [it] a feeling of brotherhood... [You] could see how incredibly thin the Earth's atmosphere is and realize...there is no lifeboat, and everybody is in it together." – Astronaut Don Lind in *The Overview Effect: Space Exploration and Human Evolution*





"Suddenly you get a feeling that you've never had before, that you're an inhabitant of Earth. You don't look down at the world as an American but as a human being." - Tom Stafford, Apollo 10.

"The pity of it is that so far the view...has been the exclusive property of a handful of test pilots, rather than the world leaders who need this new perspective, or the poets who might communicate it to them." - Michael Collins, Apollo 11



"...We are traveling in a very small speck of dust in the over-all universe...There shouldn't be wars and all the difficulties that we have. That's a very common feeling among people that have flown in space whether they are Russian or American." – Astronaut and Senator "Jake" Garn

"Getting outside of Earth and seeing it from a different perspective...will have a direct impact on philosophy and value systems." – Astronaut Edgar Mitchell, Apollo 14



"For the first time in my life I saw the horizon as a curved line. It was accentuated by a thin seam of dark blue light – our atmosphere. Obviously this was not the ocean of air I have been told it was so many times in my life. I was terrified by its fragile appearance." - German Astronaut Ulf Merbold

"Nothing had prepared me for [it]...I did not have the words to match the scene. No one does...the power of the situation was simply overwhelming. One result... was that I had become much more philosophical, at times unable even to focus on minor problems back on Earth because they just seemed so small in comparison to what I had experienced...we broke the familiar matrix of life and couldn't repair it." - Eugene Cernan – USA – "Last Man on the Moon" – NOVA Online



"...it's hard, sitting here...to really visualize that this earth is rotating on its own axis and orbiting around the sun. I don't care how many times you look at the globe or the models that show us in relationship to our solar system; it isn't quite real to you. You know it intellectually. But the first time you look out at the Earth and see that...it finally is clear to you... You've seen it for yourself...not just because somebody told you or because you read it in a textbook or saw a model of the universe ...There's no doubt in my mind that if more people fly, there has to be more understanding of what I'm talking about." – Astronaut and Senator "Jake" Garn



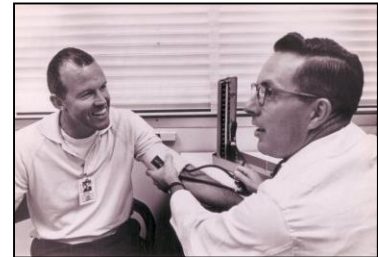
Phrases like “...strange dreamlike experience,” “...reality was like a hallucination,” and feeling like they had “...come back from the future,” occur time and again. Finally, many astronauts have emphasized that space images do not come close to the direct experience, and may even give us a false impression of the real nature of the Earth and space.

“It is virtually impossible to describe... You can take people to see [IMAX’s] [The Dream Is Alive](#), but spectacular as it is, it’s not the same as being there.” - Astronaut and Senator Jake Garn, in *The Overview Effect*



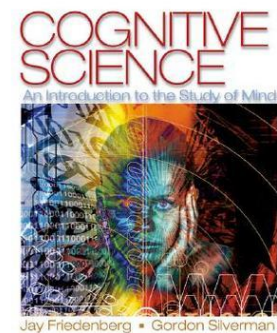
“Those who saw pictures of the Earth and then thought ‘Oh, I’ve seen everything those astronauts have seen’ are kidding themselves; an image alone was a pseudo-sight that denies the reality of the matter.”- Apollo 11 Astronaut Michael Collins

And in subtle or dramatic ways *it changed them!* Dr. Charles Berry, the astronauts’ long-time physician and surgeon said, “Not one of the men who went into space came back unchanged. Sometimes I think they don’t understand what happened to them.” Further, many astronauts believe that when public space travel arrives, that it will have a similar impact on the whole world. *So why should this be so hard to communicate?*



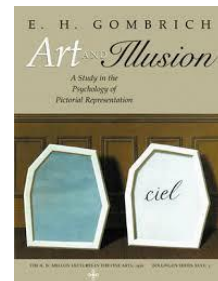
Perception Research and the Overview Effect

Current cognitive research demonstrates that even your perception of the physical world, the images that you seem to be just seeing right now, are actually “constructed” by your brain, based only in part on the patterns on the retina of your eyes. The relatively stable image of the world you see is largely based on the patterns left in your brain from your multi-sensory experience with the world. This view leads many cognitive researchers to refer to perception as “[the brain’s best guess](#),” a guess based largely on past experience.



The Limitations and Potential of Media Imagery

Similarly, media and art researchers and theorists explain that the only way we can *recognize the world in pictures* is by the brain building on the patterns left by past experiences, as well as our experience with pictures. (See [E.H. Gombrich’s - Art and Illusion](#)).



When those who have not been to space see pictures of the Earth and the stars, the brain constructs our visual experience *only from other pictures* rather than previous direct perception. So when a person travels into space for the first time, *the brain is inundated with a vast amount of new data*. “Space Tourist” Richard Garriott, said that it was “*like drinking from a fire hose of new information!*” The previous image of the world in the mind is rapidly and radically updated and “overwritten” by a massive amount of new sense data.



Space images have additional limitations. Framing and camera settings to document missions often delete scenes and details that the astronauts see. A good example is the view of the stars, which are deleted from most space mission images due to the overloading of camera sensors by the bright Earth and space hardware. While media descriptions of space often describe it simply as “black,” listen to how astronauts describe the stars:



“Instead of seeing a black sky with pinpoints of light, it's almost as if you see a white sky with pinpoints of black. That's how many stars there are.” – Michael Lopez-Alegria holds the current record for the most American EVA's (spacewalks)

“What I found was that the number of stars was just so immense. In fact I couldn't pick up individual stars; it was like a sheet of light. I found that fascinating because it changed my ideas about how we think about the Universe.” – Al Worden, Command Module Pilot on Apollo 15



When we first saw photos of the Earth, they were giving us *new sensory data* and *changed our mental image of the Earth*. But soon they became familiar and lost their freshness and their power to shift our worldview. New photos may show us new views but with little new information, let alone the surreal sense of heightened reality of the original views.

Rapid advances in *immersive media technologies* will, over the next decade, be important tools for communicating the space experience and bringing the potential for a greater experience of the *Overview Effect* for millions. Dictionary.com defines





Douglas Trumbull's MAGI Technology
[International Society for Presence Research \(ISPR\)](#).

immersive as – “*pertaining to digital technology or images that deeply involve one's senses and may create an altered mental state.*” The degree to which you seem to be *immersed in the media experience* rather than *looking at it* is technically called the “sense of presence.” There is an immense amount of research in this field, perhaps best represented by [The](#)

Worldviews and the Overview Effect

We all have an amalgam of experience, information and belief that constitutes our “worldview.” Worldviews and paradigms have been studied and applied in multiple fields from politics and international relations to history. Worldviews, like paradigms, comprise mental frameworks that underlie both the way we see the world and how we live.



George Lakoff, a leading cognitive scientist and linguist has said: “... *many people believe that they are consciously aware of their own worldviews...Perhaps the most fundamental result of cognitive [brain/mind] science is that this is not true. What people will tell you about their worldview does not necessarily accurately reflect how they reason, how they categorize, how they speak, and how they act.*”

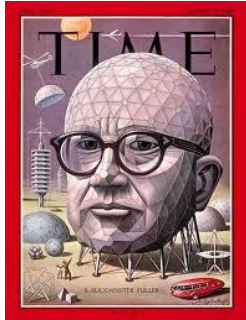
“Where just asking people fails, as it usually does, the cognitive scientist turns to model-building...The idea is to construct a model of unconscious...worldviews that will meet [analytical requirements] as closely as possible.”

The Lack of a Unifying Image of the World - The Global Village in Conflict

For most people, the world is a hodge-podge of sovereign nation-states, ethnic and cultural groups with different perspectives and agendas. Without a unifying identification and felt connection with a world-entity, the various divisive agendas take precedence in one’s worldview, making conflict inevitable. Lacking a world entity to identify with, similar to one’s family, community, nation or other identifiable group, *acting in the best interests of the “world” is an abstract intellectual effort.*



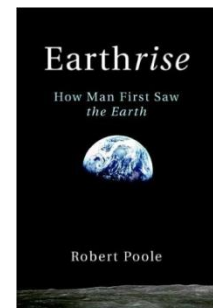
While the fact that the Earth is a planet is common knowledge to every school child, we've seen that many astronauts have recognized that *the knowledge is only intellectual*, and that the sudden direct perception produces new understandings and concerns for the world, based on the implications of what I have called, *planetary awareness*; the reality and nature of life lived on a planet.



The great futurist, philosopher (and inventor of the geodesic dome), Buckminster Fuller, who popularized the term *Spaceship Earth*, often said that while we intellectually know that we live on a planet, our mental model of the world is largely just an enormous flat plane, based on our perception on the ground. He said that if you examine the differences in how these two models of a world play out, it actually accounts for many of the inappropriate and destructive ways we relate to both the environment and to each other.

Widespread planetary awareness will allow us to see and think about all of these human and natural issues as part of a single tightly interwoven system, as well as the realization, as some astronauts have put it, that *"we are all in this tiny, fragile lifeboat together,"* a sense that astronaut Ron Garan has called a feeling of *"elevated empathy,"*

British historian Robert Poole, in his brilliant book on the societal impact of the Earth-from-space photographs – *Earthrise*, summed up this striking difference very succinctly: *"Confronted by the reality of the Earth from space, the fuzzy 'one world' idea was tried and found wanting. Its place was supplanted by a sharper concept, more ancient than 'one world' and more obviously visual, the concept of the whole Earth."*



This then is what the *Overview Effect* of space travel offers to the world; a concrete visual entity of awesome beauty and presence to which we already know that we belong, *the Earth itself*. But as the astronauts say repeatedly, once it is seen directly it is no longer a concept, but an emotionally engaging reality, as much as our communities and nations, but one which binds us *all* together.

The Critical Issue is the *Time-Frame*

Assuming the success of the NewSpace Industry, and especially Space Tourism, aspects of the *Overview Effect* will *eventually* percolate through the culture. But without an early awareness of the true nature and value of the space experience, it will take substantial numbers of



citizen space travelers sharing their experiences, before effective efforts begin to viralize the reality of the *Overview Effect* in time to overcome widely held perceptions of Space Tourism as simply *joy rides for the rich*.

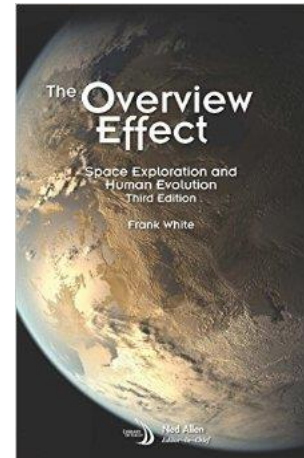
Many experts who study the process of worldview/paradigm change, such as historians, anthropologists and philosophers of science among others, hold that proposing a new cognitive model, *before attempting to demonstrate it*, is far more likely to engage a paradigm/worldview shift, than demonstrating *and then proposing an explanation*. In today's mobile internet, media events hardly even occur before there are multiple interpretations that quickly spawn memes that take on their own authority, which often persist even after later facts and alternate analysis prove them false or misleading.

Frank White and His Seminal Book on the Overview Effect



These unusual and profound effects of the astronauts' view from space might have remained intriguing but isolated comments known only to space insiders and a few enthusiasts *if not for the landmark work of one man*. In 1987, Harvard educator and space philosopher Frank White, while a Senior Associate at the *Princeton Space Studies Institute*, wrote *The Overview Effect: Human Evolution and Space Exploration*. White contemplated the profound perspective of those who

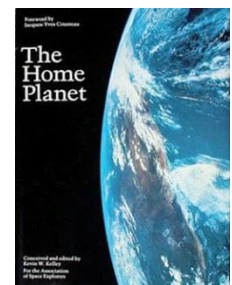
would live in space in the future, and more importantly, how this perspective, once communicated to the public, might change world culture in vitally important ways.



Over the next few decades, and through two new editions published by the authoritative *American Institute of Aeronautics and Astronautics* (including dozens of astronaut interviews), "*Overview Effect*" has become the most used concept in the space community to describe the astronauts' experiences.



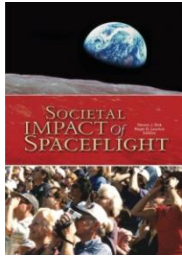
And in the mid-'80s, the astronauts and cosmonauts founded their own organization, the [Association of Space Explorers \(ASE\)](#). In the book [The Home Planet](#), published to commemorate the founding of ASE, they said:



"...we are united by a common important goal... We hope that everyone will

come to share our particular cosmic perception of the world and our desire to unite all the peoples of the Earth in the task of safeguarding our common and only, fragile and beautiful, home.” – ASE Co-founder and Cosmonaut Oleg Makarov - Preface to The Home Planet

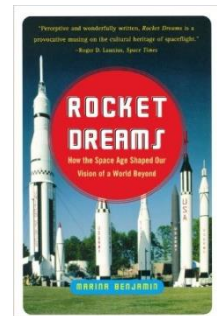
The Societal Impact of Space Flight – The View of Space Historians



In 2006, a conference of renowned space experts, historians and cultural observers convened by the *History Divisions* of both NASA and the *National Air and Space Museum*, met to assess the [Societal Impact of Space Flight](#). This conference, and the 600+ plus page book it produced, is one of the most comprehensive such studies ever made; especially from inside the American space program.

The Introduction states that NASA was tasked by its founding document to establish *“the potential benefits to be gained from...space activities.”* Yet, *“the mandate to study societal impact went unfulfilled as NASA concentrated on the many opportunities and technical problems of spaceflight itself...It is time to take up the challenge once again.”* The study asserts that the need *“remains urgent”* and may help to fulfill the larger NASA vision and program.

The study says that *“spaceflight has affected culture in multiple ways, ranging from worldviews altered or completely transformed by the images of Earth from space...to our place in the universe.”* It quotes space writer Marina Benjamin in *Rocket Dreams*, as saying *“the impact of seeing the Earth from space focused our energies on the home planet in unprecedented ways, dramatically affecting our relationship to the natural world and our appreciation of the greater community of mankind, and prompting a revolution in our understanding of the Earth as a living system.”*



The study further suggests that, *“Spaceflight...might produce transformations as radical as those that the Renaissance imposed on the medieval world.”* It might even *“result in a total reorganization of society. It might be like nothing we have ever experienced before.”*

Finally, the report states a *“firm conviction that public education and developing anticipation for the many potential positive effects suggested by the astronauts based on their own experiences should begin NOW [authors’ emphasis] and not waiting until they become obvious after greater space access and programs are implemented. The vision drives the will to accomplish.”*

The Founding of the Overview Institute

Realizing the lack of public awareness of the Overview Effect despite its wide acceptance in the space community, Frank White and I co-founded the [Overview Institute](#) in 2008, with the help of [20 experts](#) in the fields of space, cognitive science, simulation media and virtual reality.



Reviewing hundreds of published astronaut accounts, we focused our mission on the issues essential to understanding both the *Effect* itself, the barriers to its communication, the tools and strategies for overcoming them and finally, why it is important to bring this aspect of human space travel into these cultural conversations *as quickly as possible*.

A short documentary on the *Overview Effect* and the work of the *Institute*, titled simply [“Overview,”](#) produced by the UK documentary team *Planetary Collective*, has more than seven million views on *Vimeo* and has had very favorable reviews on NBC, BBC, NPR, PBS and other major media sites. It focuses on interviews with five astronauts, commentary from Frank White and me, and some of the most beautiful views of the Earth from Space.



While this well crafted documentary helped greatly to get the *Overview Effect* outside the space community, it has been typical of other videos, web sites and news outlets that have covered our work. The focus in nearly every case has been on the astronauts’ extraordinary descriptions.

But when we want to understand a social and psychological phenomenon that has huge implication for the rest of society, we apply the expertise of *“the best and brightest minds from every relevant field.”* Largely this has not been true in the telling of the *Overview Effect*. Filling this gap is the mission of the *Overview Institute*. So let’s look at how experts in “relevant fields” look at the space experience and how it translates through media images.

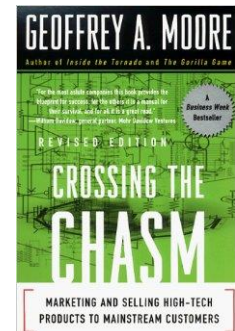
Why Space Leaders Don’t Talk More about the Overview Effect

You might expect that an experience, either actual or virtual, that brings a change of perspective that might help to solve many world problems, would be included by the NewSpace industry (or even NASA), in all of their interviews and press releases. However, the space industry is focused on technology and science and largely staffed by engineers and run by entrepreneurs, intent as they should be, on creating reliable, safe and profitable technology. Cognitive/media analysis of the space experience is just not in their traditional tool kit. Thus

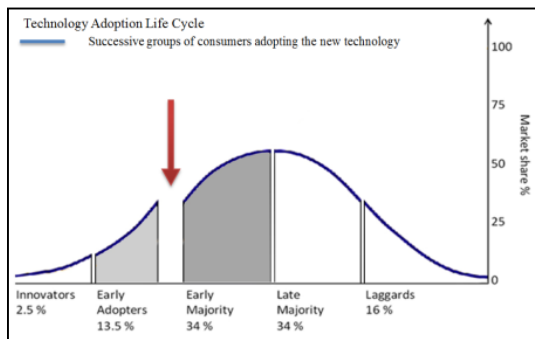
while they *know* of the *Overview Effect*, they don't have the research and language to communicate it persuasively.

One approach to inclusion of the *Overview Effect* in the NewSpace Industry's program that is more business-based is the marketing of "disruptive" technologies; technologies that are radically new and tend to disrupt existing markets and buyer's agendas...like space travel.

The book [Crossing the Chasm](#), by high-tech marketing guru Geoffrey Moore (referred to as the "bible" of disruptive tech marketing), emphasizes the vast difference in the buying psychology of the small group of "Early Adopters" of new technologies, and the "Early Majority" buyer (who generally comprises a third of the total market!).



If a new technology sector does not quickly shift to an *Early Majority* marketing approach, well before exhausting its *Early Adopter* segment, it



risks "falling into the chasm," losing sales, and often, whole companies. Current Space Tourism media focuses on "the thrill of the rocket ride, the exhilaration of zero-gravity and the view of the 'beautiful Earth'." This appeals to the space *Enthusiast* and the *Early Adopter*, but does little for the *Early Majority*, which wants to see "an enhancement to their life or work."

The *Overview Effect* on the other hand, offers an enhancement to the work of the growing world-change community, perhaps especially the environmental movement; and growing public support for environmental and humanitarian efforts make these movements ideal "entry segments" into the larger *Early Majority* markets. If successful, it will likely accelerate the rate at which people learn about and experience the *Overview Effect*. But if NewSpace "falls into the Chasm," the beneficial spread of the *Overview Effect* will be greatly delayed.

The Problem of Time-frame

With Space Tourism flights likely to begin over the next couple of years, and with major media coverage, there is scant time to turn the little known research on the *Overview Effect* into common knowledge. Otherwise, current memes about the space experience may quickly dominate. During the time-lag before their demonstrations become common and robust, world-change criticisms (as well as other anti-space arguments), will continue to minimize space in the public's mind. The beginning of commercial flights or other in-space achievements will

not automatically reverse this negative image, and such a reversal will then take time. And time is growing short.

World-change critics are increasingly adamant that the next decade may well be a tipping point for many of these critical global crises. Bill McKibben, one of the leading environmental spokespersons, [has recently said](#) that if, within the next decade, we do not begin to severely minimize our impact on the environment, and potentially, if we don't find ways of *beginning to reverse it*, we will be facing catastrophic changes in the environment that may be with us for hundreds of years, *even if we succeed in later efforts*.



On October 6, 1997, then President Bill Clinton made this remark in his Keynote speech for the



Whitehouse Conference on Global Climate Change: "...when the Apollo astronauts first went to the Moon, we gained an entirely new perspective on the global challenge we face today... Every astronaut since has experienced the same insight, and they've even given it a name -- the Overview Effect ... I challenge everyone in this room to rise to a vantage point high enough to experience the overview effect. It will enable us to reach common ground."



Conclusion

Clearly the world is in need of a new perspective, one that will unite it to deal with the enormous challenges of the 21st Century. As Robert Poole said so eloquently, *"Confronted by the reality of the Earth from space, the fuzzy 'one world' idea was tried and found wanting. Its place was supplanted by a sharper concept, more ancient than 'one world' and more obviously visual, the concept of the whole Earth."*

But the astronauts' experiences tell us that the direct perception is far more immersive and transformative than any concept or conventional media (though media technology is in a time of developing newer, more immersive and virtual forms with greater potential for communicating the Overview Effect). But we are at a critical moment in world history and

unless efforts begin now to bring the transformative potential of space flight and immersive space media into greater awareness, the opportunity for them to play a vital role in solving our perfect storm of issues, may be overshadowed by more conventional but less meaningful space flight memes.

I am advocating nothing less than shifting the worldview of our civilization. I am certainly not suggesting that the *Overview Effect* of space travel is a panacea or magic bullet that will solve the world's problems, only that it is a unique and underutilized resource. The *Overview Institute* was formed to carry forward this message, but the Institute is a small ad-hoc group, and it will take many more talented people to accomplish such a major goal.

This essay is therefore a call to action to all those who have begun to grasp the potential of the *Overview Effect* to bring about a beneficial and transformative *planetary awareness*. We invite you to contact us for more information, ideas, and networking; and for you to share your ideas and present efforts with us. To those who respond positively to these questions, whether you contact us or not, please join with us in common cause in helping the *Overview Effect* change the way we see the world.