



7. Singularity Space Contour

By Bob Krone

Introduction

In what environment could Yehezkel Dror's Singularity Contour thrive? Answer: in the long-term, Space (Figure 1), but this will first require much progress in that direction on Earth.

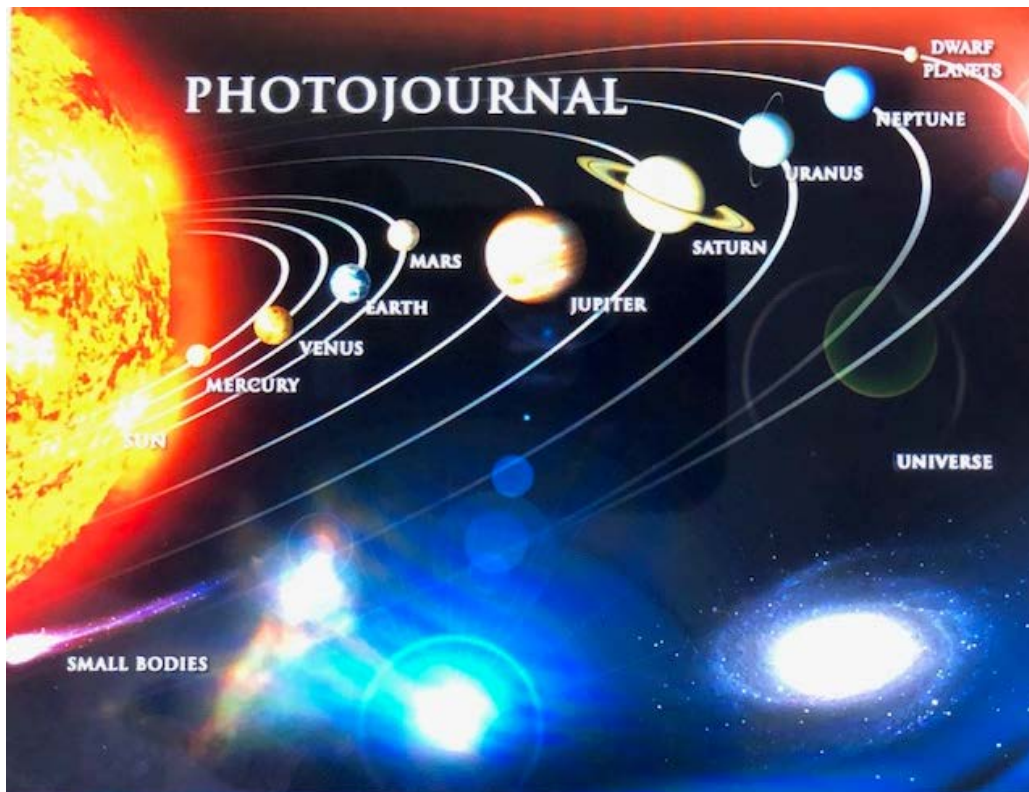


Figure 1: Jet Propulsion Lab Diagram of the Solar System

What follows is the why and how for that answer.

Readers should absorb Yehezkel Dror's article #6, "Singularity Contour," prior to reading this article, which is designed as a follow-up and complementary article to it. The Kepler Space Institute (KSI) Board of Directors and leadership consider the Dror "Singularity Contour" article as historically accurate and profoundly important for what he describes as "the emerging phase leap of the human species." Dror uses the term "Singularity" because it is today the most prominent academic and scientific focus on the future of the evolution of the human species, championed by Ray Kurzweil. In common usage, the focus is predominantly on the merger of human intelligence and machine intelligence, while Dror expands that focus and recommends putting what he calls *Anthropogenesis*

at the center – that is, *the increasing capacity of the human species to recreate itself and its environments.*

The purpose of this article is to contribute to what Dror described as a need for “a total shift in human perspective.” We do so from our past and current involvement and study with Space exploration, development and human settlement. We do not claim that this is the only, or necessarily the best, perspective, but we consider it a feasible and very desirable possibility as the 21st century begins. **Bob Krone.**

Setting the Stage: The Four Equestrians of Singularity

In the 6th Chapter of The Revelation of St. John, the last book in the New Testament in the Bible, John saw the signs of his times. He saw the Four Horsemen of the Apocalypse. The first horse was white, and the rider carried a bow and went forth conquering. The second horse was red, and its rider had a great sword to kill and to replace peace with war. The third horse was black, and its rider spread famine and pestilence. The fourth horse was pale, and its rider was death, followed by Hades (Figure 2).



Figure 2: 1887 painting of the Four Horsemen of the Apocalypse by Victor Vasnetsov

Those four beasts and their riders still bring misery, suffering, sorrow, and death to the world. Lester R. Brown, Founder of the Worldwatch Institute and the Earth Policy Institute, followed the travels of the four horsemen and issues threatening human progress, He sees “The World on the Edge.” His message is that we need to mobilize efforts to save civilization by changing its direction:

Time is running short, but we can pull back from the edge. While security is a major concern for the world’s governments, we have inherited a definition of security from the last century, one dominated by two wars and the Cold

War. Rather than armed aggression, today we are at risk from the fallout of climate change, population growth, water shortages, poverty, rising food prices and failing states. Military spending worldwide exceeds \$1.5 trillion annually, yet they do little to address these true threats to the future.

The Four Horsemen of the Apocalypse have been galloping throughout human history because of behavioral characteristics of at least parts of humanity, such as fanatical tribalism. Those horsemen have been roaming Earth for thousands of years, perhaps with guidance from a smiling Lucifer (see Yehezkel Dror's story above in article 5B), but also due in part to the evolution of humans, which has perpetuated dangerous characteristics through human genes.

All four horsemen need to be defeated and replaced with the vision of reverence for life within ethical civilizations. Dr. Jonas Salk, America's micro-biologist who conquered polio, moved his thinking to macro sociology in his 1973 book, *Survival of the Wisest*. He described humanity as transitioning from "Epic A," survival of the fittest, to "Epic B," survival of the wisest, with uncertainty whether that transition could be achieved. Charles Darwin had scientifically described the survival of the fittest. He had not prescribed how to change that reality or, at least, to ameliorate it to meet human values. Darwin's work was a scientific achievement that precipitated a value change. But world societies are not revealing progress toward survival of the wisest, as discussed by Salk in his book. A large amount of research is confirming Yehezkel Dror's Singularity requirement for humanity as a compound deliberative agency to take up this fateful challenge.

The remainder of this article provides one model for doing so. It is titled *The Four Equestrians of Singularity*. They follow:

1. Yehezkel Dror's Policy Sciences and Anthroporegenesis
2. Education
Note: These two must be human designed and implemented.
3. Recursive Distinctioning
4. Human Spirituality
Note: #3 is an autonomous phenomenon in the universe and #4 is a mix of human genetics and learning as well as depending on inspired moral-spiritual leadership.

I have used the title Equestrians to replace the single-gender Horsemen. All genders will share responsibility. Yehezkel Dror and I had an exchange related to the macro-approach to this hugely complex, and unprecedented vision. I have used in my approach to uncertainty, flowing from my Systems Science and Management background, the saying:

When in doubt, choose optimism, then manage wisely to achieve a self-fulfilling prophecy.

Yehezkel stated that this statement cannot be validated from history, although we can hope it occurs in the future Singularity as well as Space Epoch. He recommended:

But, when in doubt choose realism, within a mood of optimism; then act to prevent the bad and achieve the good.

Of course, Yehezkel's statement is accurate, although in the management world there are examples of optimistic attitudes creating a self-fulfilling prophecy outcome, together with many failures. However, the history of Earth reveals a depressing list of pessimistic, depressing, and tragic outcomes, which is why the Four Horsemen of the Apocalypse should be replaced with the Four Equestrians of Singularity.

A look at each of those four necessary components:

1. *Yehezkel Dror's Policy Sciences and Anthroporegenesis.*

This entire special issue of the *Journal of Space Philosophy* is devoted to this subject. It presents Yehezkel Dror's current vision and definition for the future of Policy Sciences under his Singularity umbrella. It is a 2018 contribution to science flowing from the history of his career studies, writings, praxis, and teaching. The spectrum of hard and soft sciences will also need to be tapped for their contributions to this challenge. Dror is not saying that the Policy Sciences can fill the complete need – only that they are essential for the design, planning, and instantiation of radically novel types of normative philosophy, governance, law, policy-composing modalities, science and technology direction, and so on, without which humankind will face rapidly increasing and more fateful risks, up to the extinction of the human species.

2. *Education and Learning*

In Article 5C above, "Learning Policy Sciences," education and learning are addressed. The reason this is one of the four Equestrians for Singularity is the validated history of education, in a broad sense of that term, as partly shaping individual, group, society, national and international values, beliefs, actions, and behavior – good or bad. Rather than delve into the massive documentation on the potentials and limitations of education, I will just give readers an individual story that is very personal to me. I know that personal experience must not be generalized. But let me cite my case as illustrative that given certain conditions, education can have significant impacts.

The Salena Conway-Gregory-Krone Story.¹

As I think of a part of the spirituality-linked education within me, I feel a higher being hears me, understands me, and most of all will guide me towards accomplishments of human dignity within the goals that I might pursue.

I am remembering when I was in a Catholic boarding school mainly for girls finishing my elementary schooling, that one of the requirements for graduation was to submit a "manuscript of writing" to school leadership. I prayed ardently that my writing would be acceptable. "Thank God" it was.

¹ Salena Conway Gregory-Krone is a Research Associate member of the Kepler Space Institute (KSI), and she has previously published in the *Journal of Space Philosophy*.

However, as time passed, I still was not assured that it would be sufficient, but I remembered that experience as I progressed.

Years later I was in a United States Air Force (USAF) Management Training position. I became aware that the writing on important military subjects by the top civilians in this military office was often incomprehensible. From that moment on, I no longer worried about my writing. I developed over time the capability to advance from the CAF-1 lowest rank (Department of the Army Civilian Service) to the higher GM-13 rank (Government Management)."²

The truth that the Salena Story represents is that in some situations, education of the very young builds socially positive or negative values for the future of society. When young children are taught that those not like them must die, the odds are that some will become killers. Moving toward a positive Singularity for the human species will require appropriate education from birth to maturity and adulthood.

However, as demonstrated by the failure of the Enlightenment in Germany and other large-scale cases, for education to be effective, it has to be redesigned. And even optimal education cannot achieve much unless it is supported by a broad array of cultural and material substructures.

Lacking essential prerequisites, education has rarely led to beliefs, values, and actions compatible with the Dror Singularity. Values and understanding are demanding, and they require much more than formal education to meet Singularity requirements.

The scholar Michael Polanyi (1891-1976) made major contributions to the theory of knowledge.³ His identification of *tacit knowledge*, obtained from living experiences, being distinct from *explicit knowledge*, obtained through formal education, has provided a powerful insight for analyzing human beliefs and behavior. His findings included: "We know more than we can tell," "What we know and can tell is accepted as true," "We must believe to understand;" and, "Tacit Knowledge accounts for: (1) A valid knowledge of a problem; (2) The Scientist's capacity to pursue it, guided by a sense of approaching a

² This story was written for this special issue of the *Journal of Space Philosophy*, dedicated to the Legacy of Yehezkel Dror, by Salena Conway Gregory-Krone on July 7, 2018 at the request of husband Bob Krone. These lessons she learned from parents, in elementary school, in high school, and then at university, guided her for the rest of her life. She became one of America's pioneer Civil Rights professionals in US Government Service, was one of the first leaders of Equal Employment Opportunity (EEO) at Norton Air Force Base, California. In 1972 She personally designed and wrote the first EEO Plan, after the US Civil Rights Legislation was amended in March 1972. That plan was approved by major USAF leadership. She later became influential in the development of national EEO Plans within the Department of Defense. The Air Force awarded her its Top Performance Award in its Equal Employment Opportunity Program. Her career has been recognized in the US Congressional Record.

³ Michael Polanyi was a professor of Physical Chemistry and Social Sciences at the Kaiser Wilhelm Institute, University of Manchester and Merton College, Oxford, UK. His four books on the theory of knowledge were: *Science, Faith and Society* (London: Oxford University Press, 1946); *The Study of Man* (London: Routledge and Kegan Paul, 1959); *Personal Knowledge* (London: Routledge and Kegan Paul, 1962); and *The Tacit Dimension* (London: Routledge and Kegan Paul, 1966). He and Dror became friends during a year shared at the Center for Advanced Study in the Behavioral Sciences, at that time in Palo Alto. Dror feels he learned a lot from Polanyi while enjoying shared discourse.

solution; and (3) A valid anticipation of the yet indeterminate implications of the discovery arrived at in the end.”

There is a large body of research confirming the validity of that personal knowledge distinction of Polanyi. In the history of manned Space flight, America has experienced three major catastrophes: The January 27, 1967 test of the Apollo 1 Capsule, in which three of the original astronauts, Virgil Grissom, Edward White, and Roger Chaffee died when the pure oxygen in the cabin exacerbated an electrical fire; January 28, 1986, when the Space Shuttle Challenger’s O-Ring seal for the right solid rocket booster failed, killing all the astronauts; and Space Shuttle Columbia’s loss on February 1, 2003 when it disintegrated upon re-entry into Earth’s atmosphere. Post-accident investigation for the Challenger loss revealed that there was advance mission tacit knowledge of the defective O-Ring by engineers, which was discounted by launch decision makers.

The above points leave open coping with depth psychology factors shaping personality to some extent. That subject is also beyond the scope of this essay. Clearly focusing on any single basis of Singularity knowledge and action will be insufficient and self-defeating. A comprehensive and creative systems approach is needed,⁴ and it will have a steep learning curve.

Inter alia, there are realities of current education that cast doubt on its effectiveness as a reliable contributor to a future Singularity:

1. Education has failed to solve major global, or local, social problems.
2. A needed critical mass of Singularity-committed and knowledgeable teachers is not, in 2018, being prepared; nor are there any national or international plans to do so.
3. It is unknown whether education can overcome genetically imprinted propensities in humans, or whether advances in genetics or artificial intelligence can address the causes of pathological behavior, without inadvertently making matters worse.
4. It may be necessary to focus first on global Singularity elites, starting with political leaders and Singularity policy scientists, as proposed by Dror.
5. Even more urgent are global spiritual Singularity leaders – but their emergence is beyond “social architecture.”

We, in KSI, will try to advance thinking, research, and education on all these issues, recognizing that much more is needed.

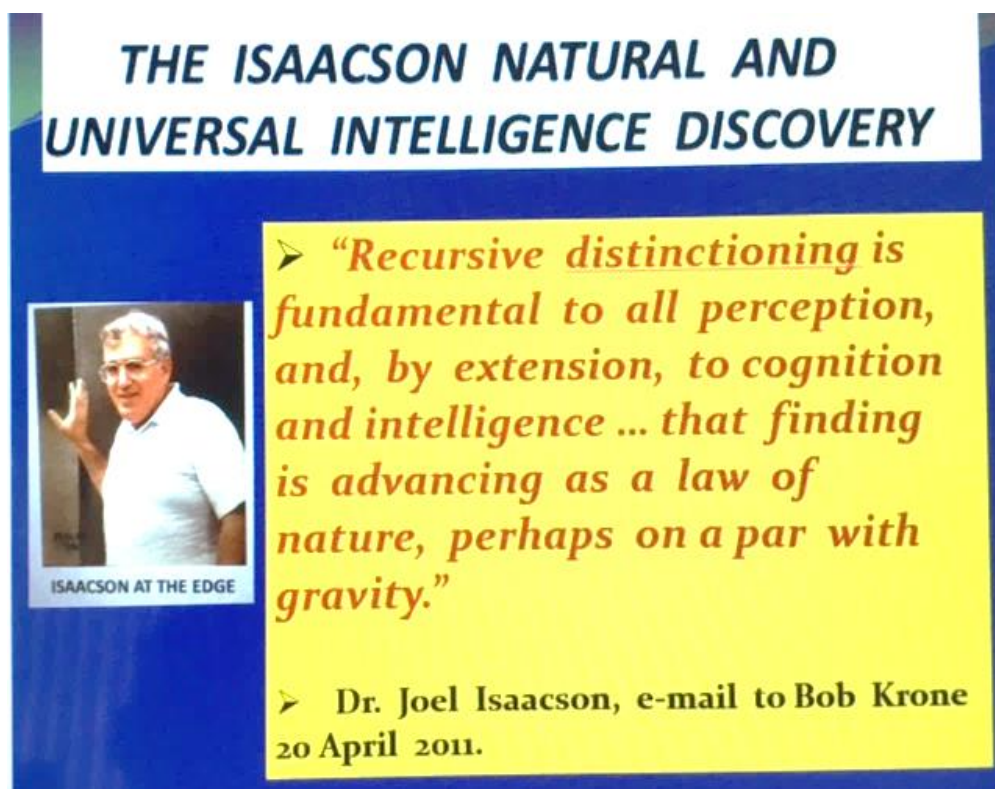
⁴ I avoid here getting into the voluminous historical literature on Systems Theory, Systems Thinking, Systems Management, and Systems approaches to research. I spent a career on the Faculty and Administration of the University of Southern California in Los Angeles for the Master of Science and Systems Management Degree Program (the MSSM), where I was the Chair for the Worldwide Systems Management Department. In my book, *Systems Analysis and Policy Sciences: Theory and Practice* (New York: John Wiley and Sons, 1980), for which Yehezkel Dror wrote the Foreword, those subjects were covered. My definition of “Systems” there was: “A complex set of interacting elements.”

Research Questions: Following are just a few illustrative research questions that deserve study in future advanced study programs:

- How can we generate decision makers' understanding of and support for fitting Singularity policies (called by Dror in his recent writings "humanity-craft") before catastrophes occur?
- How can we upgrade salient human propensities?
- How can Singularity issues be put into national and global agendas?
- How can a Singularity-Steering Global Regime be advanced?

Required reading for all future KSI students will include *Space Abundance for Humankind's Needs*, (forthcoming 2018).⁵ It presents a current systems approach to the issues presented above. This Yehezkel Dror Legacy issue of the *Journal of Space Philosophy* will also be required reading, and it may be published as a softcover book to make it available to a large audience.

3. Recursive Distinctioning, as introduced in the following statement by Dr. Joel Isaacson, who discovered it in 1964:



THE ISAACSON NATURAL AND UNIVERSAL INTELLIGENCE DISCOVERY

➤ *“Recursive distinctioning is fundamental to all perception, and, by extension, to cognition and intelligence ... that finding is advancing as a law of nature, perhaps on a par with gravity.”*

➤ Dr. Joel Isaacson, e-mail to Bob Krone
20 April 2011.

The publications providing the discovery, diagnosis, definitions, descriptions, and ongoing research for Recursive Distinctioning (RD) can be found by searching the internet for Dr. Joel D. Isaacson and Dr. Louis H. Kauffman. The most recent publications will be found

⁵ The Krones: Robert M. “Bob” Krone, PhD, Salena Gregory-Krone, GM 13(Ret), and Kat Krone, MBA, *Space Abundance for Humankind's Needs*. BookBoon Publishers. Free digital downloading.

in issues of the *Journal of Space Philosophy*. To capture the interest of readers of this issue we provide the following statements by Louis Kauffman, one of the world's most distinguished mathematicians, presented at an April 4, 2017 Session of the National Space Society's 35th International Space Development Meeting at St. Louis, Missouri:

Recursive Distinctioning (RD) is the study of those systems that use symbolic alphabetic language that can describe the neighborhood of a locus (in a network) occupied by a given icon or letter or element of language. An icon representing the distinctions between the original icon and its neighbors is formed and replaces the original icon. This process continues recursively. RD processes encompass a very wide class of recursive processes in this context of language, geometry, and logic. These elements are fundamental to cybernetics and cross the boundaries between what is traditionally called first- and second-order cybernetics. This is particularly the case when the observer of the RD system is taken to be a serious aspect of that system. Then the elementary and automatic distinctions within the system are integrated with the higher order discriminations of the observer. The very simplest RD processes have dialectical properties, exhibit counting, and exhibit patterns of self-replication. Thus, one has in the first RD a microcosm of cybernetics and perhaps, a microcosm of the world.

Joel Isaacson is Professor Emeritus of Computer Science, Southern Illinois University at Edwardsville and Principal Investigator of IMI Corporation. Louis H. Kauffman is Professor of Mathematics at the University of Illinois at Chicago, recipient of the Warren McCulloch Award (1993), the Norbert Wiener Medal of the American Society for Cybernetics (2014) and, most recently, the Bertalanffy prize for outstanding work in complexity thinking (2016).

Joel Isaacson writes: Dr Bernd Schmeikal has recently suggested a fundamental structure of the universe relation between RD and Minkowski spacetime.



KSI has conducted three annual RD conventions, 2015, 2016, and 2017. A fourth will occur in the Spring of 2019. Reports on the conventions are available in issues of the *Journal of Space Philosophy*.

4. Human Spirituality

The need for humans to think, dream, and hope for better futures must have been naturally ingrained at life's origins and passed on through the generations. Some of those hopes have been for compassion, love, humaneness, consideration, sympathy, tolerance, happiness and well-being. Some about making more money, amusement, and entertainment. Some about the amelioration or abolition of hunger, crime, poverty, despair or injustice.

Select humans have spent their lives attempting to increase international collaboration, human welfare, individual and collective security, social justice, and other moral values and goods. Small elite groups of utopian thinkers, secular and religious, have dreamed about creating peace on Earth through universal understanding. But not all spiritually based actions are for the good. All too many have caused genocides, making much of history into what Hegel called a slaughterhouse.

Underlying many of the mentioned characteristics are beneficial or harmful forms of Spirituality. Therefore, we make another normative assumption and prediction here:

Beneficial spirituality is essential for the future of humans on Earth and in the future in space.

From 2009 to today, 2018, Kepler Space Institute has had a team of diverse theologians thinking about the creation of parts of a *Space Manifesto* that, if and when widely accepted, would spare increasing parts of humanity, on Earth or beyond it, from the terrors of Earth's historic religious conflicts. Our study team leader has been Pastor (Dr.) Lawrence Downing. His following statement will be a foundation for continuing efforts to formulate and propagate a Space Manifesto tied in to the Singularity.

"There is within the human frame a powerful presence that we cannot measure, precisely define or empirically examine, but we recognize its existence and influence on our lives from the beginning of time. Numerous terms have been created in an attempt to identify this essence. The ancient religious traditions speak of soul, spirit, space and breath. Some suggest that by whatever term one may select to identify the presence that is an essence of our humanity, we confront a mystery. In KSI's academics professors and students will have opportunity to reflect upon this power, explore how this understanding inspires, guides and challenges us as we set our minds on places beyond Earth. "



Pastor (Dr.) Lawrence Downing
The KSI Space Faith Team, 11 November 2010

Why does the Future Space Epoch Offer New Thinking ?

Space exploration, and ultimately settlement, can contribute a lot to the emerging Singularity Epoch. A valuable contribution to understanding the fundamental differences between Earth and Space are the writings of Frank White on *The Overview Effect*. His Overview Institute has 3,000 followers. His insights came from his personal interviews with astronauts, and he describes a cognitive shift in awareness reported by them from their experiences from Earth orbit or the lunar surface. In the perspective from Space, national boundaries vanish, the conflicts that divide people become less important, and the need to create a planetary society with the united will to protect this “pale blue dot” becomes obvious.

All the resources humans will ever need are waiting in Space. The Law of Space Abundance, which states that Space has Abundant Resources to Meet Human Needs,⁶ has been proven valid. Scarce resources have caused conflicts and catastrophes throughout history. Space will not be the only source of solutions for Earth’s problems, but it will open new doors to doing so.

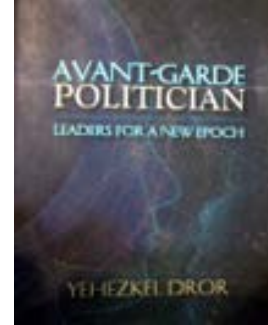
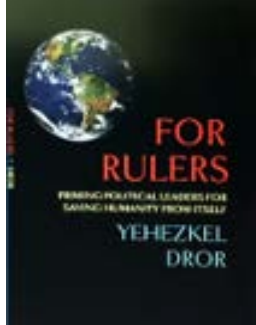
There is a huge spectrum of subjects to be investigated, documented, discovered, and researched – then applied – if humankind is to overcome the problems, mistakes, and pathologies of its history on Earth, and to steer its future evolution beneficially. Science, technology, and education continue to give us some of the needed tools and hope for the future. Our Earth cradle has brought us nearer to maturity, but we are far from there. But science and technology has also given humanity the tools for its own extermination. All the more so, innovative values and understanding, augmented tools, redesigned institutions and positive political as well as spiritual-moral leadership are urgently needed.

Yehezkel Dror’s unique scholarly-praxis career provides us with (1) realistic historic analysis, (2) evidence of the increasing risks to humanity in the 20th and 21st centuries, (3) Policy Sciences to improve the capacity to steer the future, (4) his Singularity Contour for humanity, and (5) *A Mirror for Rulers* to guide the urgently needed novel genre of political leaders.

This dream can become a future reality if the critical mass of moral Leadership and effective governance can be created. Without this unprecedented leadership and international collaboration ... the movement of humanity into Space will remain a dream or, even worse, may take the form of nightmares becoming dismal realities for Earth’s people

Yehezkel Dror

⁶ The Leadership of the Kepler Space Institute formulated The Law of Space Abundance in 2009. It is not a legislated law. It reflects the extensive research on Space resources to date. Current findings will continue to validate it over time.



To add two concluding comments:

1. Thinking and acting on human Space settlements requires a much longer time scale than current discourse. This will require quite a shift in short-term thinking dominating much of politics and business.

2. Throughout history, war and violent revolution have been among the main drivers of social transformations. This was the case through the 20th century, and it is likely to continue in the 21st century and beyond. But Dror is not recommending war to improve coping with the Singularity; rather, he poses the need for a global decision and enforcement regime designed to prevent dangerous missuses of Singularity knowledge and tools, whether on purpose or accidentally. He prescribes a “Platonic Global Leviathan.” This will involve a sociopolitical paradigm shift. It will require the kind of avant-garde political leadership and rulers that he designs in his latest two books, shown above, as essential for humanity’s improvement and survival. But this involves difficult long-term efforts. In the meantime, space exploration and the beginning of space settlement can provide safeguards for the survival of humanity in case of devastating catastrophes on Earth, and with time, they may stimulate essential changes in human values and institutions, in part thanks to innovate social structures in human societies beyond Earth.

Ongoing global transformations need guidance, to avoid very negative looming consequences and realize very positive potentials. Markets, civil society etc., however important, cannot be relied upon to provide the needed guidance; normatively and realistically only governance can do so. However, to adequately fulfill crucial future-building tasks, politics must be revitalized, democracy must be refocused, and governance must be radically redesigned.

My personal feelings are that Yehezkel Dror’s wisdom is a blessing for global rulers and for humanity. Readers of this issue of the Journal of Space Philosophy are invited to send thoughts to:

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