Astrosociology Research Institute (ARI)

Astrosociological Insights

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Introduction: Space, Culture, Society, and Asteroids

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Greetings! As CEO of the Astrosociology Research Institute, I hope that you find the contributions contained in this newsletter insightful, educational, and interesting. The Astrosociology Research Institute thanks the contributors to this newsletter for their submissions.

Most of this issue of *Astrosociological Insights* is devoted to the theme of space, culture, society, and asteroids for a very good reason. The relevance of outer space became clear to the world last February as one anticipated asteroid flew by the Earth while another unexpected asteroid impacted the Earth's atmosphere over Russia. (Details of these accounts are found in subsequent contributions in this newsletter). In this particular piece, the focus will be less on specific events and the reactions to them, and more generalized to examine how the definition of astrosociology relates to asteroid defense and failures to mitigate the risks posed by asteroids in a more abstract sense.

For those new to the field, astrosociology is the scientific study of social, cultural, and behavioral patterns (called astrosocial phenomena) related to outer space. This definition links space-related issues to humanity in terms of how these issues impact society, culture, and behavior. Taking the example of the major theme of this issue, an undetected asteroid flying through space does not fall under the purview of astrosociology because no human knows that it exists. Once it is discovered, however, or if an asteroid strikes Earth with little or no warning, then astrosocial phenomena come into play. In the latter case, the aftermath of the impact defines the astrosocial phenomena as individuals, groups, organizations, and institutions try to cope with various elements related to the devastation.

Culture consists of ideas for the most part (though it also includes material culture, which consists of human-made objects), so there is one set of mainstream ideas that characterize a given society's attitudes about asteroids in our example. If a period of fear or uncertainty exists before a known strike, ideas within the social groups that make up a society begin to shape how people will react. Social values dictate actions while social norms enforce those values. Again, if an impact occurs in a populated area, then the social norms bolstered by social values dictate what types of actions should occur. Of course, such a serious event will also cause some panic and forms of deviance that counter the larger culture as members of subcultures, which include families, religious groups, and professions, act on values that counter – or at least depart from – the larger, mainstream culture.

Several questions immediately come to mind. How many resources should be allocated to asteroid detection and defense? How prepared can a society become to cope with an asteroid strike if detection or defense fail? How prepared can humanity become as a whole? Like most things, it comes down to the expenditure of money and other resources, and the politics that define their allocation. As individual societies, and as a species, we will need to decide what level of protection (in all of its various forms) is appropriate. After that, of course, we will have to carry on with the consequences should a city killer sized asteroid hit Earth within our lifetimes. Just how ready are we, today?

Framing the Issues in an Astrosociological Context

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Deputy Executive Officer, Astrosociology Research Institute
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This newsletter focuses on some ideas about the relationship between asteroids and humanity. Contributors to this newsletter looked at issues ranging from the threat (real or perceived) of an asteroid impact on Earth to the economic, legal, and ethical issues present in any policy discussion about asteroids. As editor of the newsletter, I wish to thank the contributors for their submissions.

The various issues presented in this newsletter represent a small spectrum of the issues that one can consider in a discussion about asteroids and their effect on humanity. From security concerns to economic viability of asteroid mining, almost all of these issues have been offered in various literatures, but the contribution we offer here is meant to encapsulate the astrosociological themes inherent in the issues discussed by the various contributors contained in this newsletter.

The astrosociological perspective is important if we are to understand the social dynamics following the celestial events of February 2013, as well as those that occurred in the past and will occur in the future. Let us examine what happened and the subsequent astrosocial phenomena that followed.

As the world waited for asteroid 2012 DA14 to make a close flyby of the Earth just inside the orbital distances of Geosynchronous orbit on February 15, 2013, another undetected celestial object penetrated the Earth's atmosphere over central Russia and exploded with an energy output thirty to forty times greater than the energy output of the atomic bombs dropped on Japan by the United States during World War II. Many Russians that lived near the Chelyabinsk and Yekaterinburg regions of the Ural Mountains witnessed or awoke from the resulting air blast and subsequent damage with fragments of the meteor impacting Lake Cherbakul about eighty kilometers away from Chelyabinsk. Not since the discovery of the regional impact from the Tunguska event in 1908 has Russia or the world seen such destruction from a celestial object intersecting with the Earth.

However, unlike the Tunguska event, the physical and social consequences occurred at a greater degree with direct severity on human society. Estimates reported from the region show that over fifteen hundred people sought medical attention and that the injuries ranged from lacerations caused by debris and glass dislodged by the air blast to treatment for shock. In contrast, the Tunguska event only flattened the regional forests. News of the air blast spread across the planet through social media websites in Russia and internationally. The time it took for the news to spread was orders of magnitude quicker than news reported about the Tunguska event.

As a result, those on the internet, in other nations, and in the affected regions formed their own theories about the cause of the phenomena observed. Some did express their belief that what they had observed was likely a meteor exploding in the atmosphere. However, other people had different theories. Some of the proposed theories conjured up Cold War thoughts including a possible missile test or an artillery attack by the United States or China on Russia. Vladimir Zhirinovsky, Leader of the Liberal Democratic Party, took to the floor of the Russian Duma decrying the event as an attack by the United States. In contrast, some Russians made light of the situation. For example, Professor Ryaglov's brother, who lives in Chelyabinsk, wrote on the day of the event "Hey Vadim…. What are you guys doing down there in the US, developing new exotic Astro-ecological weapons? Why test it on us?... You have Nevada and Alaska." Nevertheless, evidence of a multitude of social reactions at the community and individual level can be heard on the many YouTube videos and Russian social media websites—and Russians do have a way with words.

Consequently, the Russian Government took swift action to dismiss an American attack and took note that their and other States' nuclear detection satellites monitored the event and concluded that a meteor had penetrated Russian airspace and exploded over central Russia. Russian President Vladimir Putin even offered policy prescriptions for future events and assured Russians that the government

was in control of the situation and consulting with other nations on mitigation strategies—as the Russians have done in the past in a variety of international fora.

In comparison, in the United States, government officials and scientists went to the airwaves and Congress to describe the science and the policy options that exist for mitigating the threat and the exploitation of asteroids (this occurred in Russia as well to some degree). Many sought to turn the event into an opportunity for future action. For example, NASA Administrator Charles Bolden testified before the House Science Committee to lobby for more funding to detect asteroids, an underfunded NASA mandate that has existed in various forms since 1991. John Holdren, Assistant to the President for Space and Technology, added that an impact from an asteroid of sufficient size to cause widespread damage to the Earth was remote and made note of the challenges of cataloging asteroids of such size. To mitigate some of these challenges, Bolden and Holdren discussed the private-public partnerships that exist or might be explored including those with universities and private companies that seek to mine asteroids. In contrast, Bill Nye, Executive Director of the Planetary Society, and Astrophysicist Neil deGrasse Tyson, went on television to promote science and education about asteroids. Each offered their own views on the future of human society in outer space, American space policy, and industrial capacity. To their credit, they provided the public with information about the Solar System, stoking the fires of imagination about careers in science, technology, engineering, and mathematics.

The celestial events of February 2013 capstone our understanding of how outer space affects human society. Somewhere in between the Russian and American responses and those ideas offered by Mr. Nye and Dr. Tyson lie astrosocial phenomena, i.e., those social, cultural, and behavioral patterns associated with stimuli related to outer space. The hopes and fears of our public figures provide ample evidence that perception and knowledge can vary our conclusions about astrosocial phenomena in unstable or opaque social situations. Thus, this raises the need to study astrosocial phenomena and their social consequences. The contributions offered in this newsletter are a step forward toward that goal.

The Role of Citizen Sensor Based Science in Detecting & Analyzing Meteor Impacts

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The dramatic detonation of a meteor over the Ural mountains in Russia that occurred without forewarning in February served to bring home, all too closely, the exposure that the Earth faces from untracked space borne objects. At the same time, a new awareness is growing of the role that citizen operated sensors are playing in reporting such occurrences as a powerful tool for both increased safety and the accumulation of scientific understanding. The fiery trail of the meteoritic boloid that streaked through the atmosphere over Chelyabinsk was captured on the dashboard video cameras of numerous motorists in the vicinity of the impact zone. Footage of the event subsequently became emblazoned upon the global consciousness, posted online with even greater immediacy than the traditional media outlets. Such rapid public broadcast, coinciding with or even preceding official radar and seismic reporting, is the latest example of a novel phenomenon in which amateurs are making valuable contributions to science of first hand data. This new societal ability, made possible through the universal adoption of smartphones and other miniaturized recording devices, stands in stark contrast to the societal capabilities during the last atmospheric meteor explosion of similar magnitude; the 1908 Tunguska impact, of which the only recorded evidence was of resultant physical and environmental effects. In the case of the Chelyabinsk event, the decentralized and widespread base of citizen sensors provided some of the most widely used imagery for media coverage, and also allowed scientists to ascertain the inbound angle of the meteor and understand its entry into the atmosphere.

The era of widespread surveillance, having arrived as feared, is however continually developing unexpected and beneficial facets. In a reversal of the surveillance panopticon, the emergence of sousvelliance, or the democratic access to and use of similar monitoring technology, is allowing a new model of citizen science in which individuals have become empowered as participants in remote sensing activities previously capable only to large institutions. This evolutionary shift in ubiquitous technology usage and commercialization is transforming citizens the globe over into effective cells that comprise a

massive CCD with the power to capture fragments of events from different perspectives and at different scales. When compiled and analyzed, these many individual sources of data provide a wealth of information invaluable to scientists and researchers concerned with events like the Chelyabinsk meteor explosion. New platforms such the Google augmented reality glasses, which feature constant recording and internet posting of video, and even the next generation of civilian cubesats with propulsion, pointing, and enhanced sensing capabilities, promise to both popularize the concept of global monitoring by private individuals as a normative behavior, and serve to cement such activity as a legitimate and even essential aspect of public, techno-social, and scientific life.

Automatic daily life digitization will prove to be both a boon for civil liberties and governmental oversight as well as for facilitating new advances in our collective situational understanding. Most importantly, the emergence of ubiquitous sousveillance via citizen sensors will also allow larger safety margins and help to save lives in potential disaster situations. In the Chelyabinsk explosion, the shock wave that followed was the actual cause of injuries, which numbered over 1,500. With an early warning system enabled by the monitoring of imminent potential dangers, such as large meteors, through citizen based and networked sensors, the most localized and responsive alerting system is made possible while at the same time providing real time information to civil defense authorities and the scientific community. Citizen sensors are already allowing the collection of massive amounts of vital data essential to all aspects of local, national, and global communities, and will play an ever increasing role in understanding and mitigating the impact danger from celestial bodies.

Social Challenges From Meteorite & Asteroid Threats

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History has shown how impacts coming from cosmic origins are both quantitatively and qualitatively different from other hazards. The death toll from the impact of a meteorite or asteroid no larger than 1 km-wide could reach hundreds of millions. This is also an equal-opportunity hazard, with everyone on the planet at risk from impacts across the entire size range from Tunguska-class up to extinction-level events. Realizing the challenge of explaining this unfamiliar hazard, the scientific community has worked to facilitate communications with the media and the public. Although the impact hazard is clearly a matter that affects all nations, to date only the US government has taken significant steps to tackle the problem directly through scientific research and astronomical observations. The reluctance of governments to include impacts within their disaster planning and responsibility continues. When this issue does surface, it is likely to be in terms of the smaller impacts. Although as individuals we are more at risk from large impacts, a disaster manager or government official is more likely to be faced with a small impact within their jurisdictions, especially if this jurisdiction has a large area. Should we begin to develop technologies for deflecting asteroids? Many would argue that it is prudent to begin such research before an actual threat is identified. Others argue that since these technologies are unlikely to be needed within the next few decades, it is a waste of resources to do any work at present. But essentially no funds have been spent for this purpose.

Eventually, it will be necessary to decide who, or which, institution should be in charge of efforts to deal with the impact hazard. While NASA has taken the lead in supporting the Space Survey and the scientific study of asteroids and meteorites, there is no official plan that allocates responsibility for either prevention or emergency response if an impact takes place without warning. Astronomers sometimes ask, rhetorically: “Who should I call if I discover an asteroid on a collision course with the Earth?” In any action scenario, it is not clear whether the population of the target area or of the Earth as a whole will trust either scientific judgments or the decisions of public officials. If an asteroid is discovered with an initial well-publicized non-zero chance of collision, and subsequent observations ultimately convince the scientific community that it will miss by a very small margin, will the public believe them? While an occasional media “scare story” may stimulate public interest, it can also backfire if the public conclude either that astronomers do not know what they are doing or that they are “crying

wolf" to attract public attention. Communicating the nature of this hazard, with no historical examples but possible fatalities of a billion or more people, is a continuing challenge. In conclusion, we note that we are interested in protecting people today, not future generations. The surveys we carry out and the mitigation strategies we develop are directed toward a possible impact within the next century. If it falls on our generation to defend the Earth, we need to be prepared.

For more information, please visit http://www.spacegeneration.org/asteroid.

The Fear Factor in Planetary Defense

Kathleen D. Toerpe, Ph.D.
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We are a planet on alert. Like Chicken Little in the age-old children's tale, we are looking upward at the skies, waiting in fear for what may be falling down upon us. It seems there are two new reasons to be fearful. In the wake of 2012 DA14 and the Chelyabinsk asteroids, NASA Administrator Charles Bolden and White House Science Advisor John Holdren recently advised Congress on how to protect the Earth from future asteroid impacts: prepare (if we have enough advance warning) or pray (if we do not!). With no tested, much less foolproof way, to detour an impending asteroid past Earth, prayer may be comforting, but is hardly a strategy. And throughout the month of March, the Science Channel has presented both a fictional alien invasion of Earth and a "definitive" guide to aliens as part of its *Are We Alone?* series. The programs present sensationalist scenarios, punctuated by the expertise of real-life scientists who (unwittingly?) validate the series' apocalyptic tone and walk a blurred line between science fiction and science fact. Taken together, it seems we are weaving a new narrative – or recasting an old one in a modern remake - of a humanity threatened, under siege and looking warily up at the stars.

Whether the threats from either asteroids or aliens are real – or *credible*, in military parlance – is not really the point here. That is a question for scientists and governments to determine and to chart an appropriate response. But fear is a powerful motivation and is easily exploited. Legendary storyteller and filmmaker, Orson Welles, tapped into people's irrational fears of invading Martians in his 1938 radio broadcast of H.G. Wells' *War of the Worlds*. That many listeners who missed the initial disclaimers believed the show was real and that Earth - or at least New Jersey - was under alien attack reveals the power of story, of culture, and of belief. That people hysterically packed their cars to flee from the supposed alien invaders shows the immediacy and power of fear.

Narratives wield a force beyond the sum of their words or images. H.G. Wells writing of an alien invasion or Bruce Willis' last moments on an exploding asteroid is clearly drama; NASA's Charles Bolden's and CUNY's Michio Kaku's ominous warnings strike a deeper chord. Astrosociologists, in all our guises as sociologists, psychologists, historians, philosophers, anthropologists, and artists need to join the conversation and contribute to - even sometimes correct – this updated narrative of humanity's fear of outer space menaces. If humanity must live with the ever-imminent threat of a city-leveling asteroid or alien invasion, then we must mediate that fear and put it into a wider context of planetary risk. Remember that both New Orleans and Vesuvius were leveled by earthly disasters, not interstellar ones. And since we have not made any contact with aliens yet, it is premature to plan Earth's demise.

In the long run – if we survive unscathed, of course – the current narrative dramatizing the threats to our planetary safety may prove partly beneficial. It can give us the opportunity to act as a unified planet, to break down hardened geopolitical boundaries and, crucially, to see ourselves for the first time as "Earthlings." It brings to the foreground questions of meaning, value, ethics, and beliefs – precisely what it means to be human – in a century that may perhaps see us experiencing First Contact, but will definitely see us venturing into exciting but dangerous missions to deeper space. We are living – right now – as a space-faring people, but we need not be a space-fearing one. Astrosociologists can stand beside their fellow scientists and help all to look up at the sky, not in fear, but in wonder.

Asteroid Mining & Space Development

Albert A Harrison
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On the 15th of February 2013, two asteroids flew close to our home planet. One of these, 2012 DA14 had been identified earlier and, as expected, passed harmlessly within 18,000 miles of Earth. The second, unexpected meteor exploded in the atmosphere over Russia with the power of a nuclear bomb, causing enough damage to remind everyone of the perils of living in a cosmic shooting gallery. There are 9,000 asteroids greater than 300 feet in diameter that pass close to Earth and a thousand more are discovered annually. If it could have been captured and stripped of its valuable metals, 2012 DA14 would have more than paid for the damage caused in Russia as, based on its brightness, one estimator, placed its value at $195 billion dollars.

This coincidence reminds us that asteroids may threaten Earth but they are also flying treasure troves. Carbonaceous asteroids are full of water and chemicals such as nitrogen useful for life. Metallic asteroids carry huge quantities of steel, nickel, and iron. High end asteroids, which are not necessarily the easiest to catch, contain substantial amounts of platinum, gold and other valuables. Whereas a huge influx of precious metals could hurt some parts of the terrestrial mining industry, and hurt some investment portfolios, by dramatically lowering the costs of production for catalytic converters, fuel cells, and other items that use platinum and enabling vast improvements in other products (using gold for printed circuits) the overall economy should benefit.

But it is other space development companies that are the primary customers for two space mining companies, Deep Space Industries and Planetary Resources. Each seeks to provide relatively cheap construction and life support materials in support of space exploration and settlement. Metals and rocks stripped from asteroids can be used for construction and extracted water for life support and, decomposed into hydrogen and oxygen, turned into fuel. Even though there will be prospecting and extraction costs, and perhaps tugging materials from place to place, resources that are already in space will be much cheaper than lifting these resources from Earth.

Space mining companies are typical of private sector NewSpace industries that hope to move us beyond decades of planning for multi-billion dollar projects and start using available technologies and cost-cutting strategies to speed space development. Writing in the Anthropological Quarterly, David Valentine reports NewSpace is more than a projection of capitalism into space: it is motivated by a desire to "escape Earth's gravity and establish space settlements essential to long-term human survival and evolution" (vol. 85, no. 4, 1045-1068, 2012). NewSpace entrepreneurs are committed to space and are in it for the long haul. Because profit is only one motive some of the hallmarks of venture capitalism, such as short-term profit taking, are less central. Valentine adds that researchers in his field tend to be hostile to the idea of human sociality in space, a serious form of neglect that needs to be remedied – a message fully consistent with the tenets of astrosociology.

Fast NEOs, Loose NEOs: A Legal Framework for Asteroid Defense & Mining

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On February 15, 2013, an undetected object exploded over Chelyabinsk, Russia, with the force of over 400 kilotons of dynamite, injuring more than one thousand people. Sixteen hours later, the slightly larger asteroid 2012 DA14 approached Earth at an altitude lower than the geosynchronous orbit. NASA estimates that there are over one million asteroids in this size range in the vicinity of Earth's orbit. The current legal regime governing outer space, composed of a handful of international treaties negotiated early in the Space Age and an even scantier body of national laws, provides little guidance on how to handle these Near Earth Objects (NEOs).

With the growing realization of how vulnerable our entire planet is to NEO collisions, as well as the rise in the past year of several reputable ventures intent on commercially exploiting NEOs for their natural resources, this legal vacuum opens up the possibility for commercial disputes and international incidents. This is not the first time, however, humanity has dealt with common threats and roving opportunities in an area beyond the jurisdiction of national laws. In the eighteenth and nineteenth century, as various nations contended for primacy on the high seas, practical considerations created an international framework for dealing with the assertion of ownership rights in massive, mobile, resource-rich objects – whales – in areas beyond national jurisdiction. These same practical considerations should merit the adoption of similar frameworks as a foundation for resolving similar issues in the Space Age.

Asteroid mining presents a clear analogy to whaling: men in small ships, months or even years from port, must wrestle with fast-moving, massive natural objects containing resources of great value. In the North Atlantic, where American, British, Dutch, German, and Scandinavian sailors contended for the same targets, a protocol developed to minimize conflict and ensure maximal resource utilization: the crew that first harpooned a whale would have a property interest in that whale so long as whale and ship were connected by the harpoon line (i.e., the whale was made fast to the ship), but a whale that broke loose (whether dead or alive) was free to be claimed by another crew. Once a crew had started processing a whale carcass, however, they retained an interest, even if the line broke, provided that harpoons or flags remaining in it bore the marking of the original ship to evidence the original claim.

If the purpose of law is to provide a mechanism for resolving actual disputes and apportioning property according to a common conception of justice, practical considerations must prevail. In confronting tomorrow's challenges, we should look to successful past paradigms, updating them to current needs and mores, rather than inventing new, untested, regimes.

Asteroid Mining: Economic & Legal Issues

Ryan Saltz, M.S.L.I.S.
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Private enterprises can now reach beyond the Earth's atmosphere with low cost rockets making asteroid mining science non-fiction. As of July 2010, over 7,100 near Earth asteroids (NEAs) have been identified, 810 of which are greater than one kilometer in diameter and 149 are potentially hazardous to Earth. These NEAs represent sources of in-space rocket fuels and they contain essentially an "unlimited" supply of strategic materials, platinum group metals (used in medical devices and renewable energy products), cobalt, nickel, and iron.

Commodities analysts from Barclays Capital estimated the price levels commodities would need to reach in order for space mining to break even. And at a cost of one billion dollars for launching and returning materials to Earth between 2016 and 2023, copper would need to go from the current $3.81 an ounce to $476 million an ounce and gold would have to go from trading at $1,665 a troy ounce to $518 million a troy ounce. However, the team doing the calculations did not account for any economies of scale since introducing a sudden influx of hundreds of tons of any mineral into the economy would drive the price of the commodity down. These numbers and calculations are still mere speculation as the economics of asteroid retrieval leaves a lot to be determined.

It is not necessary, however, that everything mined in outer space be returned to Earth. Instead the material can be used for creating space stations, living quarters, and launch pads in space. There are also legal issues regarding property appropriation and wealth redistribution that are explicit in the international treaties that make up the backbone of space law. The most controversial is the Moon Treaty, which theoretically promotes a legal regime that is thought unsuitable to commercial ventures in outer space. Since none of the major space faring nations of the time signed the treaty it is largely dismissed. However, as more of the signatories to the Moon Treaty, such as India, develop their space faring abilities, the Moon Treaty will have to be revisited.

Report from "Constructing the Future Society in Japan" Symposium at Meiji University, Tokyo, Japan (March 31, 2013)

Renato Rivera Rusca
Meiji University School of Commerce, Assistant Professor; ARI Advisor

The "Constructing the Future Society" Symposium was held on March 31st, 2013, at Liberty Hall in the Surugadai Campus of Meiji University, Tokyo, Japan. The aim of the symposium was two-fold: firstly, to establish a precedent for a public forum where discussions can develop on the subject of how development in space technologies and enterprises affect and will continue to affect society and such themes; and secondly, to expand upon the results of the experimental eponymous undergraduate course, which I administer, in order to give students the opportunity to participate in open academic events, as well as allowing the public to view these results and provide feedback.

Renato Rivera Rusca (Meiji University School of Commerce, symposium organizer)

The one-day symposium was broken up thematically into five main sections, consisting of three main sessions each covering an overall topic, bookended by an introduction session (including the student presentations) and a final panel discussion (which, again, featured ample student participation).

Following a welcome greeting by Professor James R. Bowers of the Meiji University School of Commerce, which highlighted the significance of holding a symposium on the theme of space in Japan at a time when the Hayabusa spacecraft (MUSES-C) and the incredibly popular "Space Brothers" comic, movie, and animated series, among other things, have rekindled interest in space exploration and development among the younger generation, I presented a brief introduction to the "Constructing the Future Society" course at the university and the aims of this symposium. After this, it was time for the students to take the stage and give brief presentations on their activities throughout the course, some of which included research on the marketing strategies of COSMODE, a brand of products for daily use that has been developed in conjunction with JAXA, such as space-food and clothes made of special materials, as well as others who planned and undertook very basic but fun space lessons for children at a kindergarten. One student, who had heard the story that "space smells of raspberries" took the trouble to dowse small strips of paper in raspberry aroma formula and stick them onto all 400 copies of the day's program, and so managed to involve the audience in this amusing, yet intriguing anecdote.

Hiroaki Isobe (Kyoto University Center for the Promotion of Interdisciplinary Education and Research)

The first session, entitled "Space and Education", featured a presentation by Nasa Yoshioka, representative of the Space Development Forum Executive Committee, an organization holding annual events with the aim to promote awareness of space issues to the general public, followed by a talk from JAXA Kibo Forum's Norio Saito on his own activities teaching children about space, through which they are able to learn through practical experience.

Report from "Constructing the Future Society in Japan" Symposium at Meiji University, Tokyo, Japan (March 31, 2013) (Cont.)

The next session was titled "Space and Society" and began with Hiroaki Isobe from Kyoto University giving us an introduction into the relationship between space, culture and society. This was followed by Kobe University anthropologist's Hiroki Okada's insights on what Japanese culture in the space age actually would entail – especially when considering what a complicated issue national identity becomes for those Japanese coming back to Japan after living abroad. After these two talks, the screens were then used to play back the video presentations prepared by Jim Pass and Christopher Hearsey from the Astrosociology Research Institute, who in turn provided firstly an introduction to astrosociology as a multidisciplinary academic field and ARI as an organization devoted to the development of that end, and secondly some case studies illustrating how astrosociological methods can be applied to real-world current events in very recent memory.

Hiroki Okada (Kobe University Graduate School of Intercultural Studies)

Christopher Hearsey (Astrosociology Research Institute)

The final session was "Imagining/Creating the Future Society", and as predicted, animation director Yoshiyuki Tomino stole the show, toying with the audience by playing up his inimitable disdain for pointless investments in space exploration and the search for resources. However, he concedes that the concept of space is attractive to young minds and should therefore be presented as hope for humanity, to paint a positive image for children in an ever-bleaker environment (particularly in post-3/11 Japan). As Tomino is famous for his views on society, which may at times be considered unconventional, I felt it was of utmost importance to include his opinions and outlook on these topics, so as to eliminate any bias or semblance of advocacy for any side of the argument concerning space issues and mankind's involvement therein.

While science-fiction manga artist Leiji Matsumoto was originally planned as the second speaker in the session, he became unavailable and instead agreed to a video presentation like the ARI representatives, in which he illustrated the urgency in mankind's exploration of new methods of obtaining resources without further detrimental effects on Earth's environment, by bringing up the example of a barren Venus landscape and how it may eerily hint to an earlier, long-lost civilization. Lastly, Meiji University's Tatsu Hirukawa, an expert in mysticism and the tribes around the world that practice such rituals, attempted to frame the concept of humanity exiting their natural environment by discussing the inner space and looking at the common argument that young people in Japan

Yoshiyuki Tomino (animation director)

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Report from "Constructing the Future Society in Japan" Symposium at Meiji University, Tokyo, Japan (March 31, 2013) (Cont.)

lack motivation and goals – he believes that they appreciate a totally separate set of values. I would add that understanding the many gaps – generational, social, etc. – currently developing in Japanese society is key in putting forward any plan for a bright future.

The final round table discussion featured all of the day's speakers (with the exception of Ms. Yoshioka) including the students, and was hosted by DJ and international nightclub event organizer, "Miwaku no Kunio".

Overall, despite the typical overrun in the schedule, the audience had plenty of energy for questions, and most of the feedback collected through the questionnaires was overwhelmingly positive, in particular from younger attendants. One main point to improve upon, however, was the turnout – on a shoestring budget, and with no planning committee to speak of, there was minimal promotion, with newspaper and internet articles, Twitter and Facebook as well as the official website taking up most of the efforts to spread the word of the event. Certainly my own goal for this symposium was realized in full – to make a first step towards establishing a multidisciplinary forum on the increasingly-relevant relation between space and society.

Top Row (from left to right): Tatsu Hirukawa (Meiji University); Yoshiyuki Tomino (Animation director); Norio Saito (JAXA Kibo Forum); James R. Bowers (Meiji University); "Miwaku-no-Kunio" (DJ, Music Event Planner); Hiroaki Isobe (Kyoto University); Hiroki Okada (Kobe University)
Bottom Row (from left to right): Takashi Wada*; Kenta Sugiura*; Ayumu Asakura*; Renato Rivera Rusca (symposium organizer); Yuya Otaki*; Yuuki Kasamatsu* [**Meiji University Students*]
**Photos provided by Renato Rivera Rusca with permission. ARI thanks him for the contribution.