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Exit Strategy: Profit, Cosmology, and the Future of Humans in Space

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ABSTRACT

Commercial NewSpace industries are increasingly significant players in outer space. The temptation is to see NewSpace as merely the next step in neoliberal capitalism's search for new profits and markets. However, finance capitalism's emphasis on short-term investor "exit strategies" is actually hostile to both the cosmological vision and entrepreneurial practice of NewSpacers, who seek a different "exit strategy": to escape Earth's gravity and establish space settlements which they see as essential to long-term human survival and evolution. At the same time, critical theorists are hostile to, or ignore, the idea of space as a site for human sociality. I argue that the context of outer space—and what it promises—challenges a progressive perspective on human futures to take seriously the cosmological visions of powerful social actors whose goals naturalize capitalist relations, even as these goals are re-imagined in reference to powerful cultural and economic historical tropes. [Keywords: Outer space, future, neoliberalism, markets, cosmology]

I. A Future in Space

Amidst the political, economic, and environmental dramas of early 2010—the BP oil spill, the successes of the Tea Party movement, the reverberations

of the Affordable Care Act, the ongoing global financial crisis—one item of news received relatively little media attention: the Obama administration's 2011 budget for the National Aeronautics and Space Administration (NASA). Released on February 1, 2010, it announced the end of the George W. Bush-era Constellation “return to the moon” program, and significant funding for private corporations—or “NewSpace” industries—to fulfill transport missions for NASA, including the potential to deliver crew to the International Space Station (ISS) after the retirement of the space shuttle. The shift toward NewSpace industries had been presaged by the Obama-appointed Augustine Commission's review of the human spaceflight program in 2009 which—in a radical departure from 50 years of US space policy—had concluded that “[I]t is... time to consider turning this transport service over to the commercial sector” (Augustine et al. 2009:7). On June 4, 2010, just four months after the release of the budget, SpaceX, a premiere NewSpace company, conducted the first successful flight of its Falcon 9 rocket, the vehicle that will carry cargo—and perhaps, astronauts—to the International Space Station.¹ Six months later on December 8—a remarkably short timeline by NASA standards—SpaceX launched a second Falcon 9 carrying its Dragon space capsule, and later that day successfully de-orbited and retrieved Dragon from the Pacific Ocean. Within 18 months, on May 25, 2012, SpaceX's Dragon docked with the International Space Station, the first time a commercial company had ever achieved this goal.

These events—and others—have been greeted with jubilation within the community of individuals and corporations that make up the field of NewSpace. NewSpace is a neologism describing a broad range of primarily US-based entrepreneurs and advocates who, for more than 30 years, have aimed to commercialize outer space—thus far the province of state-led space programs—through enterprises as diverse as providing launches to orbit, space tourism and hotels, space-based solar power generation and delivery, moon settlement, and asteroid mining. On the day of the first Falcon 9 launch, a press release from the Space Frontier Foundation (SFF), a prominent NewSpace advocacy group, quoted NewSpace advocate Rick Tumlinson: “That's one giant leap for commercial space and one small step towards an open space frontier!” (SFF 2010). The parallelism of Tumlinson's remark with Neil Armstrong's famous utterance as he stepped onto the surface of the moon on July 21, 1969 is hardly incidental, as I will argue below. But more importantly, some 40 years later, it encapsulates precisely the ethos of NewSpace companies and the emerging

transformation of American human space flight. For, despite the industry's diversity, they are united by a common—and apparently extreme—vision of the future and of capitalism: that entrepreneurial activity will radically and positively transform the future evolution of society and of our species itself by establishing human settlements in the solar system and beyond.

Drawing simultaneously on American libertarian understandings of government and economy and liberal appeals to the common good, on metaphors of the American Frontier and European colonialism, and on sources in speculative fiction, NewSpace advocates argue that in order to thrive, even to survive, the human species must develop settlements beyond Earth through commercial space enterprises.² For NewSpacers, NASA is a wasteful government “jobs program,” designed not to open up a free-market space frontier but to protect Earth-bound political and economic interests.³ While the current business plans of most NewSpace companies focus on more immediate goals—launching payloads and humans to low Earth orbit (LEO)—these are seen as small steps, to invoke the Armstrong/Tumlinson metaphor again, toward a multi-world human civilization where plentiful access to resources, individual access to space, and massive wealth generated as a result would ensure human biological and social evolution into the very deep future. The temptation for critical social scientists is to see this vision as simply an alibi for new markets and profits, but in this paper I will ask: What is at stake for us as anthropologists and critical theorists in taking such kinds of cosmological visions seriously, and in their own terms?

Since 2009, I have been doing ethnographic and sociolinguistic research on NewSpace imaginaries of the future, conducting fieldwork at sites where the supporters of commercial space gather: at regular professional space conferences around the US, on teleconferences, at the Mojave Air and Spaceport, and virtually in blog and on-line discussion forums. In these sites, a broad range of people gather to work toward this future: from Internet billionaire space entrepreneurs, disaffected NASA rocket scientists, and young engineering graduate students interning for NewSpace companies, to policy wonks, science fiction fans, bloggers, consultants, and advocates from a range of fields, including law, medicine, and the social, physical, and biological sciences. In most of my fieldsites, older white men from the US—*Orphans of Apollo* (Potter 2009), as they are sometimes called—predominate, but women, younger people, people of color, and non-US citizens form sizeable chunks of this community. Politically, right

libertarianism prevails, but classic liberal Democrats and centrist/pragmatist political views are frequently in play too. Many of them (especially older white men) have been working on pet projects (orbital debris mitigation, space tethers, moon bases, Mars missions, lunar prospecting, asteroid mining, etc.) for decades, inspired by 1960s NASA promises of space settlements by the end of the 20th century. Others are new entrants to the field, often eager young students in space law, policy, or engineering programs, or they may be drawn to use their skills in media and public relations and volunteer for one of several space advocacy organizations. While they missed out on Apollo, the promise of new commercial space industries has inspired their own entry to the field, as much as it has reanimated the hopes for space settlement of older generations of “space cadets”—the latter, in this community, being anything but an insult.

Many of the enterprises people engage in—from developing space programming for kids’ television to building cameras that attach to space vehicles—may seem peripheral to the goal of human space settlement. Yet, while the relationship of individuals to the actual creation of hardware and infrastructure needed to enter and live in space varies widely, there is a remarkable solidarity across divisions of—and strong networks between—generation, industry sector, political affiliation, and even business competitors. At space conferences—in format, familiar to anyone who has been to a professional conference with paper sessions, PowerPoint presentations, and registration sign-up tables at cookie-cutter conference hotels around the country—people in fields as diverse as space-based solar power generation and space transportation businesses greet each other as old friends. Moreover, young people who I saw enter the field as unknown volunteers in the first year of my fieldwork were rapidly assimilated into these networks and came to be on first name terms with influential players in short order. In Mojave, space fans and members of amateur rocketry clubs mix with the people at XCOR Aerospace and Scaled Composites who are building suborbital spacecraft, and while proprietary secrets are carefully guarded, they recognize each other as fellow travelers as well as competitors. These dense networks are in part a mark of the relatively small size of this diverse group, but they also point to the recognition by committed participants of the broad range of activities, infrastructure, technologies, and political, economic, and social work that must be done in order to achieve the vision of space settlement. So, while the immediate referent of “NewSpace” is those companies directly

engaged in forging a commercial presence in space, I used it more broadly here to encapsulate a more expansive, positive, and indeed *urgent* orientation toward a future of space settlement, with commercialization seen as the logical path toward this goal.

I chose these locations as fieldsites because I was interested in the sociality of an emerging multi-sector entrepreneurial space industry and how particular visions and narratives of capital and of the future guide this emergence. But while my initial expectations were that people would tell me stories about the nature of capital and profit and that I would have to dig for “the future” as a theme, I found that far more frequently the explicit story being told was, rather, one about the human future and its sociality. By “sociality,” then, I mean both the day-to-day social and linguistic practices of NewSpace advocates at these conferences, online, and at their places of work, but simultaneously the future sociality they are working toward and already imagining operating in human space settlements. It is the intimacy of these socialities in relation to one another that opens the analytic space of this paper.

In this paper, I argue that beyond the possibilities for new forms of capital investment and profit, enabled by commercial space enterprise (and which, as I will show, are not incidental by any means), it is actually this promise of a radically transformed human social future that underwrites NewSpace discourses and activities. Indeed, understanding NewSpace as only the latest incarnation of neoliberal capitalism, this time written into the stars, impoverishes our understanding of how powerful social actors shape deep human futures through cosmological commitments to radical views of what it is to be human, and contributes to the narrative of a totalizing capitalism that can account for all human futures (cf. Gibson-Graham 2006). In short, the practices of powerful social actors should not be reduced to the abstracted workings of “the market” but rather, to be fully understood, they must be considered as social, ideological, but also cosmological (Chesluk 2008, Ho 2009).

II. Outer Space as Exception⁴

Sitting outside under the hot Arizona sun at the Space Access conference in Phoenix in April 2010, I ate lunch with an investment adviser, a venture capitalist-cum-space entrepreneur, and an aerospace engineer. In the midst of our conversation about the commercial possibilities for

space-based solar power, a space elevator, and a human settlement on Mars, the venture capitalist/entrepreneur said, apropos of the broader theme of space settlement: “the species depends on it.” I was struck enough by the phrasing to write it down, but this was not an isolated claim. Indeed, NewSpace discourse abounds with statements to the effect that their activities are ultimately about the survival of the human species.

Yet, while the Augustine report, Obama’s NASA budget, and the Falcon 9 launches mark, for NewSpace advocates, transformative moments in human history toward the goal of space settlement and species-preservation, to most Americans (including anthropologists and critical theorists), visions of space settlement and claims of its centrality to species survival are extreme and fantastical visions, caught up in the closed loop of mid-20th century modernisms. As the introductory essay to this collection argues, the social sciences have tended to treat “outer space” and any future associated with it literally as an empty signifier, able to represent all the fantasies of modernist futures but with none of the material consequences social scientists assign to other modernist projects. The status of outer space here is that of an exception to the rule. And yet, NewSpace claims to the inevitability of a free market future in space (and its positive social outcomes) can simultaneously be *explained by* contemporary critical accounts of the consequential nature of globalized neoliberal capitalism and capitalist imaginaries of the future: the exception can be folded into a total explanatory framework. For critical theorists on the political left, the immediate suspicion is that the former (a human future in space) stands as an alibi for the latter (a voracious and dehumanizing capitalism), a new colonial “spatial fix” (Harvey 2000) to resolve capitalism’s inner contradictions. Indeed, while there is little critical attention to outer space as a site of human sociality and politics, most of my discussions with anthropologists and other social scientists about my project begin with this assumption by my interlocutors. However, both responses are embedded in contradictory assumptions: first, that any cosmological vision of a transformative human future is necessarily always already extreme and thus fantastical and unrealistic; yet, second, that there is an inevitability to the future of an asocial and colonial capitalism, and to its dehumanizing effects. In effect, the faded 20th century promise of a human future in space stands as evidence of the failures of modernist projects even as the engine of modernity—capitalism—has an aura of inevitability, homogeneity, and totality (Collins 2008, cf. Gibson-Graham 2006, Ong 2006).

As we discuss in the introductory essay to this collection, “the future” has come to be interrogated by 20th century scholars as a mode of modern temporality, founded in the emergence of the modern nation state and characterized by temporal acceleration, the rejection of prophetic certainty, and the possibility for humans to guide the what-might-be (Koselleck 2004), (though always with the hope that the surprise of the future can be tamed and kept on track, see Collins 2008). Anthropological engagements with the future, though, have tended to be relatively minimal as Munn (1992) argued 20 years ago, in part due to anthropology’s embarrassment with the blithe futurism of the 1970s. More recently, anthropologists such as Miyazaki (2004) and authors in Rosenberg and Harding’s collection (2005) have tried to tease out the social role of future imagining as it comes to inform and shape the social practices of the present and form the contexts of immediately emergent futures. Fewer have attempted to engage the political economies of particular and long term futures.

Other critical scholars have been more willing to do so, but unlike NewSpace proponents, these visions of the future tend to be of the *end* of capitalism on Earth, not its extension into the cosmos. For example, in his introduction to *Living in the End Times*, Slavoj Žižek (2010:x) writes—bluntly—that “the global capitalist system is approaching an apocalyptic zero-point.” Like David Harvey’s (2000) discussion of the socialist future(s) that must inevitably arise out of the ruins produced by capitalism run wild, Žižek explores new forms of socialism and environmental consciousness that could (or should, or will) emerge in response. Sloterdijk (2005) in turn sees the issue of the devastation to the global environment under capitalism—in particular, the role of fossil fuels and energy—as a blind spot in critical theory, but one that will have historically transformative social and political effects and that should therefore be addressed by critical theorists. For all three, the end of the 20th century marked both the return of the worst excesses of capitalism but also imminent possibilities for new forms of political, social, and environmental consciousness, cast in socialist form, and characterized by a renewed sense of commitment to communities and other species, a human modesty toward Earth’s limits, and a retrenchment in consumption and resource exploitation.

For my lunch partners in Phoenix that afternoon, and for other NewSpace advocates, the story of the future is quite different. It is outer space itself that has the resources and literal space for humans to continue the exponential growth and expansion of markets, societies, resource

extraction, and product development, but also to expand the sites of life, human creativity, and intelligence in the galaxy, in ways that resonate strongly with the Singulatarians discussed by Farman (this issue). Rejecting the “limits to growth” position evident in many policy circles since the 1970s (Meadows et al. 1972), they cite the boundless amounts of energy, fuel, minerals, and land mass that could be used to promote not only new sources of profit, but—and as I am arguing, just as importantly—new possibilities for human freedoms, expression, and sociality (e.g., Hudgins 2002, Krone 2006, Lewis 1996, O’Neill 1976, Tumlinson 2005). Indeed, pointing to the very environmental degradation that Žižek, Harvey, and Sloterdijk see in whole or in part as presaging capitalism’s downfall, NewSpace advocates urgently insist that entrepreneurial human settlements in outer space will resolve these problems by enabling clean power through space-based solar power generation, the end of resource wars through asteroid mining, and growing human prosperity by the expansion of free markets into space.

The ideology of the necessary relationship between entrepreneurialism and a rejuvenated human future has a strongly contemporary flavor, activating social scientists’ understandings of the incessant search of globalizing—now, literally universalizing—neoliberal capitalism for new resources, products, and markets, and the negative consequences to both human communities and to the environment. But can we dismiss NewSpace visions of space settlement as just more of the same, as the new spatial fix, as only fantasies of capitalist expansion and extraction? Gibson-Graham (2006) argues that critical treatments of neoliberalism as homogenous and totalizing have in part helped build the ideological unity of late capitalism. Collins (2008) has also argued, directly in relation to conceptions of the future, that contemporary anthropology is actually aligned with neoliberal imaginaries by assuming that the market is the inevitable shaper of the future. Following these arguments, it seems to me that if we accept the argument that the market, or profit motive, are the only explanatory frameworks for these activities, we ignore other central and consequential aspects of the utopian visions at the heart of NewSpace endeavors. Harvey (2000) and Frederic Jameson (2005) both argue that utopian thinking is a key mode for a progressive and socialist politics, but that such a mode must account for spatial context, temporality, and local conditions. The key here is to think about the utopian imaginations of capitalists in the same terms, ones that do not simplify or homogenize them. And as I will

show, NewSpace activities are not simply in the realm of fantasy: companies are actually building rockets, spaceports, and habitats.

My overall point is thus very simple: without denying the potential significance of outer space as a site for new capital accumulation (and recognizing the desires of my NewSpace interlocutors for this very thing), or the need to critically examine the implications of such a phenomenon, we should not assume that such goals can explain private space enterprise *in toto*. Real fears of species extinction, ideologies of exploration as key to human nature, and a desire to escape the strictures of contemporary state formations (*and* capital) are all powerful motivations for the hopes of space settlement. These resonate strongly with capital's need for a "spatial fix," *but they are not the same thing*. In the following pages, I examine some of the tensions within NewSpace utopian thinking and imaginations of the future, both to contribute to debates about the complexity of contemporary capitalism; but also to ask how cosmology (rather than only capitalist ideologies and profit motives) may explain the extraordinary plans and work of NewSpace entrepreneurs and advocates.

III. NASA, NewSpace, and Commerce

Entrepreneurial space enterprises are a relatively recent phenomenon, emerging primarily in the US in the early 1990s, partly due to the end of the Cold War, but also because advances in computer and material sciences have recently enabled more recently established NewSpace corporations (such as SpaceX, Bigelow Aerospace, XCOR, and Virgin Galactic) to design and build space-faring vehicles and habitats independently of NASA. "NewSpace" was coined in 2006 by the SFF, primary among a good number of nonprofit organizations that promote entrepreneurial space activity, but early attempts to foster a commercial space industry stretch back to students and followers of Princeton physicist Gerry O'Neill in the 1970s. O'Neill's proposals for human habitations in space (O'Neill 1977) are often cited by NewSpace proponents as a key influence, and many of his former students and collaborators are key figures in today's NewSpace industries.

The coinage of the term in 2006, however, marks a historical moment in which several firms have had successes that make commercial space enterprise seem imminent, and not a speculative fantasy. In 2009, for example, Pacific Gas and Electric contracted with Solaren Corporation to

obtain space-derived solar power; in late 2010, Virgin Galactic, the space tourism arm of Richard Branson's Virgin brand, conducted its first landing of its WhiteKnightTwo/SpaceShipTwo at Spaceport America in New Mexico and announced plans to fly customers to suborbital space by early 2013; and both Armadillo Aerospace and Masten Space Systems successfully demonstrated rockets for lunar landing modules. The proposed 2011 NASA budget, as well as the end of NASA's 30-year-long Space Shuttle program in July 2011, solidified this sense of imminence, and NASA's Obama-appointed top administrators are strong supporters of commercial space enterprises. SpaceX's successful launches in 2010 and 2012 are just the latest evidence to NewSpace proponents that a future secured by commercial space enterprise is within grasp.

However, the commercialization of space has opponents from a number of sources. NASA's structure (spread over the country in regional centers) provides thousands of well-paying government jobs. The Obama budget has met enormous resistance from Congress members whose constituencies (notably those in Alabama, Florida, and Texas) would be affected by this plan, an opposition which severely cut funding for NewSpace industries. In addition, some opponents are scornful of the claim that NewSpace industries are "commercial" by noting that they, like heritage aerospace companies such as Boeing, also rely on government contracts. The response from NewSpace advocates is that while the government is indeed an "anchor customer," it is government's role to provide the initial investment in commercial space enterprise to open up a market and bring down prices so that non-governmental entities can gain access to space and its markets. Drawing on analogies of the US government's fostering of the early airline industry through the Kelly Act of 1925,⁵ NewSpace advocates argue that the role of government is to provide the infrastructure and investment to establish a viable industry that will then have "benefits for all mankind."

These claims resonate with the understandings developed in the critical scholarship on neoliberalism that "government" in capitalist and libertarian models is reduced to an enabler of private citizens' and corporations' economic objectives, with social good emerging from the activities of private actors (indeed, the removal of government restrictions, taxes, and regulation is itself seen as a social good in this framework). Again, it makes sense to understand NewSpace as a new manifestation of neoliberalism, in its most libertarian forms, extended to the heavens, and raises questions

about forms of governance that NewSpace proponents imagine in space.⁶ Yet despite these stories of the imminent success of entrepreneurial over centralized-government forms of investment and profit, there are tensions between NewSpace corporations and the sources of finance that they seek to underwrite their activities. Drawing on three tropes—the exit strategy, the destination, and (no) return—I will explore how NewSpace discourses open up to a cosmological future that is simultaneously enabled by neoliberal visions of economy and the market, but which are also constrained by them and, even, exceed them.

IV. Exits and Destinations

A mark of NewSpace's consolidation as a multi-sector industry was the establishment of the semi-annual Space Investment Summits (SIS) in 2006. Meeting in large conference hotels at major cities around the country, the common language of finance capitalism prevails at these day-long Summits as NewSpace entrepreneurs present their business plans. The Summits are designed to meet several goals: to introduce NewSpace entrepreneurs to the realities of financing and the dos and don'ts of presenting a business plan; to promote networking among industry specialists and investors; but perhaps most importantly to make the pitch to angel and venture capital (VC) investors for the large amounts of capital investment necessary for space activities.⁷ This is a key consideration for, as many space industry people say frequently, "space is expensive." Very expensive. One of the key upper limits on the plans of any space activity is the enormous cost of launch, and many NewSpace companies are focused on either reducing payload weights to make launch cheaper, or are looking to produce more efficient rockets with a broad customer base to bring down the per-pound cost of launch.

The structure of the Summits follows a common pattern. NewSpace entrepreneurs make presentations of their business plans, usually accompanied by slick PowerPoint presentations, in front of an audience of approximately 150 people and a panel of four or five space industry and investment experts. In the estimation of the panelists, who comment on each plan after the presentation, the best presentations are those that clearly depict not only the product or service but also details of projected business risks, revenue streams, customer base, future profitability, and returns for investors. Perhaps not surprisingly, then, unlike virtually all of

my other fieldsites, at these Summits there is no talk of space settlement, ensuring the future of the species, or of human civilization spread through the stars. Rather, the innovation presented is technological, product- and market-based, and the longest time frame posited is five to ten years into the future, the essomenic limit of contemporary investment imaginaries.

Most of the positively-evaluated presentations include projections of future profitability at a moment within this time frame, a point referred to as “the exit” or “the exit strategy.” As Karen Ho (2009) describes, the exit strategy is a cornerstone of contemporary finance capitalism, the point at which a business can be sold (usually to an investment fund, or by going public) and investors can reap their profits. As Ho demonstrates, this short-termism has become the defining feature of finance capitalism since the 1970s, fiercely promoted by Wall Street as a “mission” to return control of corporations to their “true” owners—the shareholders—through the rapid turnover of companies for maximized profit.

At the Summits, questions from investment advisors to NewSpace entrepreneurs about exit strategy get mixed responses. Some of the more savvy presenters—those with MBAs—fold a short-term exit strategy into their presentations. But for some of the presenters I observed, it seemed as though the idea had never occurred to them. This sense was confirmed at a 2009 summit, where one investment advisor told some stories about entrepreneurs who didn’t understand how financing worked: “Another gentleman gave me a really excellent business plan and when I asked what his exit strategy was he said ‘oh, I don’t plan to exit, I really like this business!’” The audience laughed at this in-joke, though my sense is that the laughter was double-edged: for investors and investment advisors, this spoke to the naïveté of a nascent industry which is not yet fully attuned to the natural order of contemporary finance capital. But for the NewSpacers, I sensed that the laughter was more uncomfortable, because they recognize in this non-joke the dilemma they face: the only exit strategy they want, in fact, is one which will enable them to escape Earth’s gravity.

It is at moments such as these that the deep-future visions of NewSpace entrepreneurs, bubbling below the surface, erupt as short-term exit strategies come up against their long-term visions—that is, the building of an infrastructure to ensure the human settlement of space into the deep future—which require a level and time-depth of investment that would make most private investors baulk. As such, the tension between investors and NewSpace entrepreneurs is not just temporal, but material too: venture

capitalists rarely invest in the kinds of infrastructural development that NewSpace advocates see as central to their goals.

This sense of a disjuncture between NewSpace and investment imaginaries is evident in a second trope I have heard several times at these Summits: the explicit denial that space is a place to go to at all. At the start of the May 2010 SIS in Chicago, Amaresh Kollipara, a NewSpace entrepreneur, began his presentation by saying: “Space is not a destination.” Rather, he said, space is an *enabler* of profit: “Space accelerates and expands business verticals by providing new disruptive ways of doing business.” Or, to translate: space is just another site, but a potentially remarkably profitable one, for new kinds of capital investment. Space, here, is presented as disruptive not in the sense of evolutionary human futures, but in the sense that it will provide unforeseen opportunities for wealth production in the very near future for those investors who have the foresight to get in the game early. By this framing, NewSpace advocates seek to demonstrate to potential investors that the goal of space exploration is aligned with the investment goals of rapid and high rates of return on investments.

Yet, again, this alignment of NewSpace with the goals of finance capital stands in tension with the vision of a deep human future in space. The May Summits are run alongside the National Space Society’s International Space Development Conference (ISDC) where, the very next day after the SIS, many of the same individuals are attending sessions and—in stark contrast to the SIS—promoting the idea of space as a destination. Indeed, a key slogan of the SFF is that “Space is a place, not a program.” Here, the emphasis on “place” opens space up as the privileged destination for the human species in the future. This placeness of space is evident in pervasive aesthetic and rhetorical framings of space settlements at these conferences. In one typical presentation on “Paths to Space Settlement” at the 2011 ISDC, photographs of the International Space Station and the space shuttle were shown in the same PowerPoint presentation as a computer-generated image of an imagined human settlement on the moon and an image from the science fiction film *2001: A Space Odyssey* (1968), alongside a narrative in which speculative future settlements were spoken of in the present tense. The abstractions of the SIS—of the market, of profits, of business verticals, of exits—evaporate in rich aesthetic and rhetorical renderings of possible human experiences in actual places. These include everything from underground habitats on the Martian moon

of Demos, the mining of the asteroid Itokawa, or a settlement at the southern pole of the Moon, all of which have been identified through intensive research as places that humans could exploit, occupy, or thrive in. While presenters implicitly accept that such enterprises would have to be funded, profitable, and rooted in a commercial rationale, these are peripheral concerns in the vast majority of these presentations.

The story I've told above is very much in line with other critical accounts of the contradictions and opposing goals within capitalist formations. As Harvey (2000) notes, the time-horizons of different kinds of capitalism are frequently at odds. Finance capital, in particular, has radically shorter-term goals than entrepreneurial, manufacturing, or other kinds of capital: "The time horizon set by Wall Street simply cannot accommodate to the temporalities of social and ecological reproduction systems in a responsive way" (2000:59). So, the indifference or hostility of financiers to NewSpace long-term goals is not in and of itself a key mark of difference between NewSpace and other entrepreneurial capitalisms.⁸ The difference, rather, lies not only in the extremity of the time-horizons of NewSpace entrepreneurs but also in the underpinning—and totalizing—cosmology of their longer-term visions of human evolution in particular places in space. It follows that the mission underpinning NewSpacers' plans exceeds not only finance capital's imagination, but sometimes also their own in ways that open up other possibilities, as I will discuss next.

V. No/Return

Like the exit and the destination, the "return" has contradictory valences in NewSpace contexts that underpin the tensions between NewSpace and finance capitalism. On the one hand, it denotes the key prerequisite of an entrepreneurial company, to produce an investment return for its investors. But the idea of return also indexes a conviction, frequently shared in NewSpace contexts, that the future success of NewSpace will be marked by the point at which *humans don't have to return to Earth*. That is, the point at which sustainable and self-sustaining settlements off-planet have been established will mark the success of NewSpace visions, beyond profit, beyond the creation of wealth.

Early in my research, I was surprised at the benchmark of "no return" as a sign of NewSpace's success, but there was talk of it everywhere. At the ISDC in Orlando in May 2009, for example, during a question and

answer period following a presentation about an Earth/Moon transport system, one audience member said that he believed that humans would only truly be space-faring once astronauts no longer had to return to Earth. His statement drew a round of enthusiastic applause. The theme of the NewSpace conference in Mountain View later that year was “Flags and Footprints—Or the New Frontier?” “Flags and Footprints” refers to the Apollo missions, the brief visits to the moon between 1969 and 1972 which left behind evidence that humans had been there, but no human settlements. The “New Frontier” marks a point in the (distant) future when humans will inhabit settlements in space and on other worlds, no longer requiring a return to Earth. So, Tumlinson’s enthusiastic claim, cited above, that the 2010 Falcon 9 launch represented “one giant leap for commercial space and one small step towards an open space frontier!” indexes, by its parallelism to Armstrong’s utterance, the passing of “government space” as an important but now outmoded form of space exploration to be replaced by commercial space enterprises. These commercial enterprises will make humans into a species that does not have to return to its origin point as Neil Armstrong and the other Apollo astronauts had to.

Spurred by this recurrent trope of no return, I began asking interviewees the following question: if I could offer you a one-way ticket to Mars, with no hope of return, but a guarantee that your basic survival needs would be met, would you take it? The majority of NewSpacers I posed this question to have said yes. Often there is a qualification—if I could take my spouse, if I could communicate back with Earth, if I could be a productive member of a team, if I was not one of the very first pioneers—but in the end most of my interviewees have said they would take my ticket. For many of us, the question might be: why? Again, in most business plan presentations at the Space Investment Summits, the answer is one we might expect: to make a lot of money. On the other hand, and again, not unexpectedly, in public presentations and public relations documents, NewSpace entrepreneurs (and from both those whose politics are liberal and libertarian in the American political sense) promise “benefits to all mankind” including medical research breakthroughs, ending resource wars, and providing cheap solar power. We see here the conventional linkage of profit-making and social good.

Yet, neither of these reasons captures the broader animating reason for most NewSpacers, which was most clearly expressed in an interview with William Watson, Executive Director of the SFF. When I asked him the

question, what's the point then? I was startled to get this response: "The point is settlement. That is the only point that could be made. You can say in the interim [that] the reason that we promote commercial space [is] ...so there may be a motivation for investors to put money into the space industry." But, I asked, why *settlement*? What's the point of *that*? Watson replied:

[it is] our responsibility to be spreading intelligence throughout the galaxy. Another way you can see it is that it's part of our survival as a species. If we don't expand will we perish? I think there's no doubt that we're far more vulnerable to destruction as a species, to extinction if we don't expand to other planets at least in our solar system, hopefully other solar systems.

While this vision may seem extreme to most of us, it is one shared by most NewSpacers. A recent news release from the SFF makes this clear. Titled "NewSpace is the Vanguard of Human Civilization," the release goes on to state "we are engaged in something really, really important, a change as fundamental as the agricultural revolution, a transition as basic as industrialization. This is not the work of a single year, or even a single generation. Yet, it is something we can do. It is something we must do" (SFF 2009). Perhaps the most articulate proponent of this vision—and this tension—is Elon Musk, founder of SpaceX which he has largely self-funded through the capital he got from selling PayPal, the online money-exchange service he co-founded in 1999 and sold to eBay for \$1.5 billion in 2002. In the press conference after the successful retrieval of the Dragon Spacecraft in December 2010, a jubilant Musk said:

The reason I'm doing SpaceX is not because I think the rocket business is the easiest place to make money, it's an extraordinarily difficult place to make money, and would be pretty low on the list of things you'd want to try if maximizing your wealth was your goal. But [...] I really want us to become a true space-faring civilization and ultimately be on a path to becoming a multi-planetary civilization and going out there and exploring the stars and making true the things that one sees in sci-fi movies and reads in book about the future. That's my goal for SpaceX. Other companies have their corporate goals of profitability and that sort of thing which is fine, that's how the economy works. I don't make any value judgements about that.

But for SpaceX it is really about furthering the cause of space. We must bring in more money than we spend otherwise we'll go out of business, but maximizing profitability is absolutely not something I care about. [...] So it's like, you should bear in mind, if you're investing this is what I'm going to do, so don't complain later that I'm not maximizing profitability.

Musk certainly wants to make money. He sees the free market as the way to get a return on his investments, and being profitable as the natural condition of staying in business. But the "no return" of achieving "a true space-faring civilization" trumps the returns on investment. In other words, for many NewSpacers, the desire to chart the course for human biological and social evolution into the deep future—to go and not return—is the reason for what they are doing. It is an imperative. Commercial enterprise is seen simply as the most natural and effective way to make this happen.

But what happens after settlement? Is it simply the reestablishment of capitalism in space? In most NewSpace advocates' accounts, yes. They cannot imagine exchange and social relations outside the framework of capitalism and profit; it is the basis for human sociality in space. But as we talk about the radical possibilities imagined by NewSpace proponents, cracks appear in this imaginary. For example, in discussing the oft-talked about possibility that an asteroid mining mission might return to Earth vast quantities of nickel or platinum cheaply, one interviewee admitted to me that this could be revolutionary outside of the terms of the market; that is, that it could revolutionize exchange relations beyond what we can imagine. Another suggested, with a laugh, that the vision of future space colonies where colonists would be profoundly reliant on one another (far more than in any Earth community) would be something like a socialist utopia. But few of my interviewees were willing to anticipate developments beyond about 100 years into the future. Beyond that limit, they hesitate to imagine what their own cosmological mission might bring about.

Meanwhile, with billions of dollars of government and private investment, personal fortunes, and untold hours of labor, NewSpace entrepreneurs are still working toward their ultimate goal. For investors, this might signify a return in the relatively near future, as for Joshua Rafaelli, an analyst at Draper Fisher Jurvetson (a venture capital firm which led a \$60 million investment in SpaceX in 2009), who told me that he sees a potential exit for SpaceX and returns for its investors in the "near to medium term."

But this exit, for Musk and for many other NewSpacers, is just an incremental side story on the path to a much grander exit which will result, they hope, in no return at all.

VI. *Ad Astra* (To the Stars)

Should we take these cosmological accounts seriously? Recently, as I explained my attempt to do so to a colleague, he became very angry with me. He argued that the cosmological mission of NewSpace entrepreneurs can only be fantasy, and to treat it as anything else was intellectually and politically dangerous because it obscured the extractive and exploitative ideologies that are fundamentally at the heart of any capitalist endeavor. Giving a counter example, I noted that several of my interlocutors are concerned about potentially civilization-killing asteroids hitting Earth and that their plans are practical and non-fantastic in the sense that species have been eradicated by asteroids before, a possibility that exceeds the demands, fantasies, or time frame of capitalism. I mentioned the famous Tunguska event of 1908 where a comet or asteroid hit a remote area of Siberia with a force roughly equivalent to 1,000 times the power of the atomic bomb dropped on Hiroshima. My colleague himself exploded at this point: “capitalism does more damage on the face of the Earth every day than that asteroid did at that moment!” While I’m not sure whether he was accurate or how one might assess the material impact of capitalist endeavors in a single day vis-à-vis a large asteroid strike, his point is not to be ignored. Yet what struck me most about this argument is, again, the implication that Earth and its recent human history brackets the totality of human experience and of its future, and that the evidence of capitalism’s effects on the Earth relegates potential asteroid strikes or human settlement in space necessarily to the realm of fantasy.

On the other hand, my NewSpace interlocutors see the assumption—on the part of most of the public, governments, and social critics—that the human future is constrained by the upper limits of the Earth’s atmosphere and by the time-span of modernity as itself a dangerous fantasy. In the words of one presenter at the 2011 ISDC: “Something is going to hit us, we need to survive. We have to convince people of that.” In this view, the Earth-bound gaze ignores Earth’s context in a broader environment of the solar system and assumes an historical context which spans merely hundreds rather than billions of years. They see history in terms of a species

imperative to expand in order to protect life and intelligence by distributing humans across the solar system and even the galaxy (as shown by Olson and Farman in this issue). But they too assume that Earth-originating, historically-recent free market principles will underpin such expansion, even as some might imagine or hint at other social and exchange forms arising in the encounter with space.

What I seek here is another kind of exit strategy: an escape from the assumption (whether rightist or leftist) that the encounter with space will simply produce a repetition, extension, or logical conclusion of history, human sociality, exchange relations or any other human phenomena that have emerged on the surface of our planet. From libertarian supporters of NewSpace endeavors, this requires following through on the radical promises they see offered by a future in space with an acknowledgment that the context of space may produce radically-different kinds of social and exchange relations. From those who see human settlement of outer space as a fantasy or a dangerous distraction from the realities of environmental collapse and capitalist excesses, this requires a willingness to engage seriously with the possibilities of space as a context for human futures. From both, it requires an engagement with contemporary human activity that is not already explained by the brief span of modern human history.

Again, it is important to reiterate I am not proposing a contradiction between cosmology and capital. NewSpacers are excellent capitalists; they certainly want to make money, and they see market forces as key to the settlement of space. Concomitantly, other entrepreneurs have visions of the social good that their enterprises will bring about, and may find finance capitalism's short-termism equally vexing and necessary to navigate. Yet, NewSpace is unique not only in that it encompasses diverse industry sectors, but more importantly because it envisions itself as shaping the *total future* of the human species and of life on Earth itself; in this way, it is cosmological. And again, these are not exclusive goals. Several of my interviewees have contested my characterization of a necessary tension between NewSpace entrepreneurs' and investors' goals. In interviews, people like Kollipara, whom I cited above, see a distinction between these goals but not a tension. For Kollipara, profit *is* both the proximal engine and purpose of NewSpace enterprises, and he sees the investment problems of NewSpace industries as natural problems of any nascent industry. But *going* is still the end goal: like most other interviewees, Kollipara was willing to accept my ticket to Mars, to abandon his

Earthly wealth to be part of the vanguard of the human future. While the market is seen by Kollipara and others as the natural engine for this radical evolution of the human future, the two are not smoothly aligned, and one cannot fully explain the other.

I conclude with another return: to the future. The very idea of “the future” provokes suspicion in anthropologists because of its suturing to the teleologies of modernity and capitalism. And “space” is the iconic site of modernity’s future. Yet, again, as Collins (2008) notes, if we accept that “the future” is necessarily the steady path of neoliberalism (or, alternatively, its overturning by a socialist revolution), aren’t we just buying into those very teleologies? In turn, if we don’t pay attention to the explicit utopian human futures of people who are powerful enough to at least set them in motion, are we not preventing ourselves from becoming involved in one of the emerging debates about what a human future should look like? To be sure, the future that NewSpacers envision is already known to them; like the anthropologies that Collins critiques, it is a future past, though in this case built on the premise of free markets, American exceptionalism, science fiction precedents, a valorization of colonialism, and libertarian principles and ethics. But if NewSpace is in a position to enact at least some of its cosmological visions, I am arguing we should engage with those visions *in their own terms*, and not foreclose them within the unfolding of a story that we already know (the eternal success of neoliberalism or the inevitability of an environmental and socialist revolution) so that we may engage with this future and the surprising sociality and exchange relations that may emerge from it. This requires taking these future visions of humans in space—no matter how apparently extreme—seriously, as a cosmology with teeth.

So this leaves me with a series of questions: How do we align ourselves with a NewSpace imagination of a radically different kind of future without necessarily accepting a narrative of the eternal naturalness of the market, even as NewSpace imaginations are at odds with key aspects of contemporary capitalism? How do we upend the assumption that history will continue along either a capitalist or socialist path, delimited by our own binarized analogies, assumptions, and metaphors of human behavior, politics, and meaning-making? How do we take this cosmology seriously without thinking that we already know the answer? Moreover, what kinds of questions about freedom, dignity, and humanness can we engage in thinking through the terms of this vision but also the possibilities

that arise because of it? What kind of duty does the anthropologist have to engage this extreme future as a social phenomenon of the present but also as a potential key for the future that opens up possibilities we may not yet have thought of?

To buy my argument about NewSpace requires, of course, another kind of investment: a willingness to accept NewSpace as a serious social movement whose plans and activities may produce at least some of the outcomes it claims. Indeed, I would claim NewSpace as a key site of engagement for anthropological investigation of material investments in—and consequences of—speculative imaginaries. In a sense, then, I share my NewSpace interlocutors' dilemma in convincing people that space is a crucial site for human futures, and that NewSpace has the potential it claims for itself. But where NewSpacers see the commercial exploitation and settlement of space as inevitable and as necessarily revolutionary, and where critical scholars may understand commercial space enterprise as mere fantasy obscuring profit motive and/or the imminent end of capitalism, I argue that we should attend to *both* these imaginaries *because* they naturalize what the future should look like and what the past has taught us. My exit is to a place where we can be engaged in a serious public dialogue about the consequences of such world-making and (potentially) world-changing visions and practices, not only for the future, but most importantly because these visions have implications for those of us still here, back on Earth. ■

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Endnotes:

¹NASA's agreement with SpaceX, under the 2006 Commercial Orbital Transportation (COTS) program, was reached during the Bush administration, which had already begun to commercialize some of NASA's operations.

²I will not discuss the use of frontier and colonial metaphors in this paper, though they are significant to NewSpace discourses and imaginaries and will be discussed in my future work (see endnote 6).

³And indeed, in the 2010 Congress, there was enormous opposition to the Obama plan from both Republicans and Democrats whose districts would be impacted by NASA job lay-offs. At time of writing, the initial funding for commercial space included in Obama's 2010 budget has been significantly cut back by Congress.

⁴This subtitle is a riff on Ong's (2006) *Neoliberalism as Exception*, though my arguments regarding space's exceptionalism vis-à-vis neoliberalism are not entirely aligned with hers.

⁵Officially the Air Mail Act, this law permitted the US government to contract with private airlines to provide air mail service. This law is often cited by NewSpace advocates as effectively creating a commercial airline industry and as a model for jump-starting commercial space enterprise.

⁶The questions of governance, property relations, and the colonial relationship between Earth and space colonies are too great to explore here. Briefly, I would note that metaphors of and analogies to European, American, Polynesian, Chinese, and other terrestrial settlement and colonial expansions abound in NewSpace talk about human exploration and settlement of space. Moreover, since there is no established legal regime for space beyond the vague articles of the 1967 Outer Space Treaty and several other international treaties (which prevent claims of national sovereignty over space objects/territory), NewSpace advocates frequently posit a range of governance forms and exchange relations emerging in space, but almost always based on Western liberal democratic and capitalist economic precedents. However, as I argue in this paper, it is not enough to assume that governance, territorial claims, property relations, or colonialism in space will follow the same trajectory or take the same forms as they have on Earth. My data indicate that these metaphors and analogies are, as I argue in this paper, confounded by the radical differences of the space environment, *but also in the imaginations of NewSpace advocates themselves*. I intend to publish on this topic in the near future.

⁷Most NewSpace companies rely on individual, or angel, investors who have less aversion to risk or more commitment to the longer-term visions of NewSpace entrepreneurs. The few companies which have attracted large VC investment—Virgin Galactic and SpaceX—were initially self-funded by their well-heeled founders (Richard Branson and Elon Musk respectively) and have clearly defined business plans and space crafts with definable missions that are likely to be able to be executed within the next five years. Most other NewSpace companies are in much earlier stages of technological and corporate development.

⁸I would argue that the imaginary of space as a failed future project of the past, which has underpinned social scientific evasion of it as a subject, is the same imaginary that dissuades investors from providing capital to NewSpace companies, because it makes even the short-term business plans presented at the SIS seem too risky, particularly in the risk-averse investment environment following the credit crisis since 2008.

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[**关键词：** 外太空，未来，新自由主义，市场，宇宙学]

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Estratégia de Saída: Lucro, Cosmologia, e o Futuro de Humanos no Espaço

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استراتيجية الخروج: الربح، علم الكون، مستقبل البشر في الفضاء

الكلمات الجامعة: الفضاء الخارجي، المستقبل، الليبرالية الجديدة، الأسواق، علم الكون