Writing Science Fiction Out of Experience
SF, Social Science and Planetary Transformations

An Interview with Kim Stanley Robinson
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Kim Stanley Robinson, who has been writing science fiction novels and short stories for over three decades, is widely seen as one of the most important science fiction writers of today. He has explored a wide range of topics including planetary transformations, climate disruptions and the relations between science, society and politics, as well as sustainable ways of living and alternatives to capitalism. Robinson's stories are often set in rather 'plausible universes' (no aliens in sight). As he explains, his distinctive SF style is a consequence of writing from, or out of, experience. To many readers, this at once evokes a sense of familiarity, and shows the transformative potentialities (whether technological, environmental, social, or personal) that lie within reach. Robinson has received many SF awards, including two Hugo Awards for Best Novel (for Green Mars *and* Blue Mars*) and Nebula Awards for Best Novel (for* Red Mars *and* 2312*). The following interview was conducted as an email exchange in October 2018, just as his newest novel* Red Moon *was published.*

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Q: Since our special issue is about the relationship between social science—mainly anthropology and science studies—and science fiction, perhaps we can start by asking about your own affinity with the former? We remember reading a perhaps tongue-in-cheek comment that you'd rather have trained as an anthropologist than as a literary scholar. Could you tell us about the interest anthropology holds for you?

KSR: I think I did say that once, yes, because I felt that almost anything would have given me more valuable life experiences for my later writing than being a literature graduate student. And it seemed to me that anthropology would be a good field for helping me to think about other cultures in the future. I had seen how Ursula Le Guin used anthropology as both content and form in *The Left Hand of Darkness* (1969) and others of her novels, presumably influenced by her parents; her science fiction was greatly strengthened by that. There was also a lighter and more playful anthropological aspect to the planetary romances of Jack Vance and Edgar Pangborn. As for me, I did some reading based on classes taken at UC San Diego, including one taught by Fredric Jameson that had me reading Claude Levi-Strauss. Later, trying to bolster my sense of what a gift economy might mean, I read Marcel Mauss and Lewis Hyde, and later Michael Taussig.

So, this is about as far as it ever went, in terms of me and anthropology as a discipline. I ended up reading more in archeology and science studies, for sure. It seemed to me that theory's intense interrogation left both anthropology and history in serious need of internal re-evaluation of methods and goals. I don't know if that was a general perception, or if it was acted on, or how.

Q: As you note, and as is evident in your writing, you are familiar with science studies. Going back to at least *Antarctica* your depictions of scientific process have a distinct STS flavor. In *New York 2140*, you cite Donald Mackenzie on markets, and towards the end you explicitly invoke Latourian actor-networks of humans and nonhumans. Can you explain a bit about your relation to this field?

KSR: I've done much more reading in science studies than anthropology, and have kept more up-to-date. Many strands came together for me when I began writing my Mars trilogy, and then when I went to Antarctica and tried to write about what the scientists were doing down there, and why. Then *The Years of Rice and Salt* (2002) gave me the problem of trying to imagine an alternative "birth of science" to the one we saw in our own history; if Europe's population had died in the black death, where would science as we think of it have appeared? That took me deep into science studies and history of science, which gave me an interest in the real scientific revolution, and in Galileo, that I later pursued. Then when I wrote the trilogy I called *Science in the*

Capital (2004–2007) (now called *Green Earth* in my preferred version)[1] I again had to think about how science operates as a set of nested institutions, and how it interacts with government and business. Here Latour was crucial, especially *Laboratory Life* (1979) and *Science in Action* (1987). Then almost every novel I've written since then has had a scientific angle to it one way or another, so the reading has been continuous.

In all this I've been helped more and more by my friend Mario Biagioli, who moved to UC Davis and thus to my town, shortly after other STS friends at UC Davis, Joe Dumit and Colin Milburn, had introduced me to him. Mario edited *The Science Studies Reader* (1999) and along with his immense knowledge of Galileo is well-versed in many other aspects of science studies. He functions as something like I imagine an Oxford don would for a graduate student, in that I can go to him with questions, and he can give me private tutorials on the topic and also send me to further reading. Joe and Colin have also helpful when I ask them questions. Because of them I feel that I am getting cutting-edge advice, news, methodologies, and so forth.

By now I've read a lot; I've watched my wife's career as an environmental scientist in the federal government; I have a good friend working at a high level in the bio-tech industry; and I've attended a lot of conferences and met a lot of science studies people. I own the complete run of *Configurations*, the journal of the Society for Literature, Science and the Arts published by Johns Hopkins and Georgia Tech, and I've read in it pretty extensively.[2] I've also interviewed any number of scientists about their work. All this together gives me a feeling of being well-acquainted with science studies, including its origins in philosophy and history of science, the impacts of theory and the linguistic turn on these, the Latourization of the field as some called it, and the current many different strands of inquiry. All of that has been crucial to all my novels from the Mars trilogy on.

Q: With respect to your observation that theory left anthropology and other fields in need of internal re-evaluations, we might suggest that the work that has developed at the intersection of the anthropology of science and technology and STS more broadly has been at the forefront of such updates and re-conceptualizations. This has of course taken many forms but among them is surely what brings us together here, namely the interest in experimenting with relations between SF and social science.

In relation to your work, it might be that comparison plays a special role in this regard. Just as anthropologists have conventionally compared different cultures (an idea which has of course also been problematized many times over by now), and STS scholars have compared epistemic cultures, for example, many of your works can be

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[1] The trilogy was released as collected edition with the new title in 2015.
[2] See http://muse.jhu.edu/journal/36

seen as large-scale planetary comparisons. Again and again you seem to ask—what kind of place is Mars that humans can or cannot live on it? Or, what kind of place is the Moon, or Aurora? What kind of transformations would need to be induced into these foreign places for them to become livable to humans, and at what cost? Can you elucidate this practice of planetary comparison a bit for us?

KSR: It has not been a program on my part, but just a matter of taking it one story at a time. Maybe it's revealing that I find these stories interesting. Mars is the main example for me, and that came about because of my interests in wilderness and utopia, science and history, all combining with the revealing of the next planet out by way of the Mariner and Viking missions. Those robotic explorations gave us so much new information about Mars that the first response was a kind of science fiction story from scientists themselves (just as Percival Lowell generated a science fiction story from his data, 70 years earlier)—the new notion that Mars might be amenable to terraforming. I took that as a way to write what was both science fiction and metaphor or allegory, or a kind of modeling by miniaturization or what Jameson called 'world reduction'— Martian society would be smaller and thus simpler, and it would be very obviously revealed to be necessarily also a place where people were actively engaged in making the biophysical substrate that we need to live. All this was analogous enough to our situation on Earth that I found it the right story to tell at that time.

Aurora (2015) was an attempt to explain why that same process of terraformation and human inhabitation that might work on Mars would not work outside this solar system, for reasons the novel tried to dramatize. The problems of alien life being possibly dangerous, while a dead world would need terraforming without much physical force being available to apply to the project; also, the sheer magnitude of distance from Earth, and the resulting huge gulfs of time needed to get anywhere, or to terraform a dead world once we got there—all these were points that needed to be made in a case I had become convinced of, that we are stuck in our solar system and aren't going to be leaving it. So that was a completely different kind of project, although obviously it does shine light from a different angle on the difficulties of terraforming even Mars, where now we are not sure if it is alive or dead (when I wrote my Mars novel it was agreed it was dead), nor does it seem to have enough volatiles to make terraformation possible.

Then the moon is different again—too small and volatile-free to be terraformed, and thus just a rock in space, a place for moon bases perhaps, but not for habitation as we usually think of it. Most of the solar system is like the moon in this; Mars is an anomaly. So the full consideration of possibilities leads to the conclusion that there is no Planet B for us, although Mars might be made such over thousands of years, perhaps. But for the most part, these stories have together convinced me that we co-evolved with

Earth and are a planetary expression that needs to fit in with the rest of the biosphere here, that we have no other choice about that—and this is an important story for science fiction to tell, given there are so many other kinds of science fiction stories saying otherwise.

Q: As an add-on, we are aware that you generally do not view the worlds depicted in your different books as part of any temporal sequence, or as parts of the same universe. At the same time, a range of semi-invariant themes appear across many of the books, including space colonization, a climate-change wrecked Earth, and relatedly, life in extreme environments. Do you see this as a set of experiments to generate variation from similar premises? Or, if not, how do these recurrent themes reflect the particular concerns of yourself, as Terran? Do your world-building experiments arise from a particular place of urgency, or do you simply enjoy thinking with certain premises?

KSR: I don't know. It's mostly an instinct telling me "this would make an interesting story, maybe even a good novel." Then I give it a try. I do have a strong affection for science fiction as a genre, and so I've been interested to try all the sub-genres or tropes within science fiction where I think I can make a contribution. Thus I've never done space opera, but *Aurora* maybe explains why; I've never done aliens either, except in joke short stories, and also in the kind of Renaissance fantasia that *Galileo's Dream* (2009) somewhat is; but I've tried other planets, space travel, alternative histories, time travel (again in *Galileo's Dream*), dystopia, utopia, after-the-fall, near-future, climate fiction (a new sub-genre), and far-future fiction, sometimes called "science fantasy," a la Jack Vance or Gene Wolfe. There's a few more sub-genres I'd like to try, but not many, and as I don't want to repeat myself, I'm kind of running out of ideas.

Q: In many of the books, including the *Mars* trilogy (1992–1996), *Science in the Capital* (2004–2007) and *New York 2140* (2017), for example, description of different philosophies for dealing with planets are central. You often give a range of positions from deep ecology or organic mysticism at one end of the spectrum to uncontrolled terraforming at the other. And you try to make perceptible what kinds of consequences and worlds these different approaches might generate. But it always seems clear that you are on the side on what could be called a pragmatic, impure form of experimentation. For example, when Amelia in *New York 2140* screams out her rage at the purists that killed her arctic bears, it is difficult not to feel this is also your voice. Can you tell us how you conceive of pragmatic experimentation and much needed alternative ways of imagining how to organize entangled societies?

KSR: I am definitely in favor of pragmatic, impure forms of experimentation when it comes to survival by way of getting ourselves into a sustainable balance with our planet. And yes, I don't like people proclaiming too vigorously their purity. That plays

into a model of pure/impure that leads to sacred/profane, or simply good/bad, that I don't think matches the biophysical realities of our position as living creatures on a planet, as a species trying to get along with other species. Most of the various "pure" positions are too self-righteous for me, too non-scientific. So, I think a program of "bold and persistent experimentation" as Franklin D. Roosevelt put it once, is a good process for getting along and trying to improve the situation and avoid a mass extinction event, which we are now perilously close to causing. Market fundamentalism is a pure idea that has failed badly but still controls far too much of our work and thinking, for instance. So I often find myself telling stories about this kind of conflict between pure and pragmatic, and about the need for open-minded approaches to our problems.

Q: Complementing this, can you say something specifically about your orientation to technology. It's clear you are no technophobe, and you describe some pretty hands-on action in terms of terraforming, not only on Mars but also on Earth (in *Science in the Capital*). And you repeatedly invoke the notion of the technological sublime. How sublime is technology and how far is it wise to pursue its sublimity, as you see it?

KSR: Human beings were technological even before we became human; in other words, our precursor species from whom we evolved had early technologies (fire and tool making) and by using them, evolved into our species. So, we are "*homo faber*," and technology is part of our DNA, literally. The question is, which technologies make life better for every citizen of the biosphere, human and otherwise, and which are destructive, either on purpose or by accident? And how can we figure out which is which, and put the right technologies to good uses? These are questions that science fiction is very well suited to explore. Questions can be posed and possible answers given, in the form of stories, situations, plots, characters' decisions and fates, and the like. So, there is a very good match between science fiction and certain pressing questions of our moment—it's why I call it "the realism of our time," which is just a slogan to suggest its usefulness and centrality.

As for the technological sublime, this I find interesting—that the sublime is an old and fundamental human emotion, but only really clarified in the system of emotions of the Enlightenment and Romanticism—that it is, as Edmund Burke put it, a combination of two sensations, beauty and terror. I think he went on to say something like, our senses tell us we are in danger (as on the edge of a cliff) while our reason tells us that we're not actually in danger (maybe a railing or something at edge of cliff)— and this clash makes for a feeling that is something like awe, perhaps. Following that, it seemed to me that our technology now puts us in the zone of the sublime all the time, in that we are in an airplane looking out the window (if we can stand to), or driving over a viaduct, or even in a traffic jam where thousands of people are

cooperating in a complicated dance that could result in death if someone did it wrong—over and over again we are in "the technological sublime," a magic zone of sorts, when it used to be very unusual (as in a lightning storm or the like), and this has desensitized us to something that really should have stayed unusual and special. Now our structure of feeling is different than in earlier simpler technological ages, although riding horseback might be an earlier example of an earlier version of this kind of change.

One follow-on to this is to suggest we are perhaps jaded and need ever-bigger psychic shocks to feel the sublime—also, that doing very simple things releases us from this constant over-heated sensation, and is experienced as a relief—lying on a beach, sitting in a garden weeding, talking face to face with someone, looking at fire, walking—I've been thinking that these old Paleolithic activities that helped evolve us to humanity still have big places in our brains, ready to register and appreciate them. This is something I've often pondered, not just as a writer but as a being in the world, an animal.
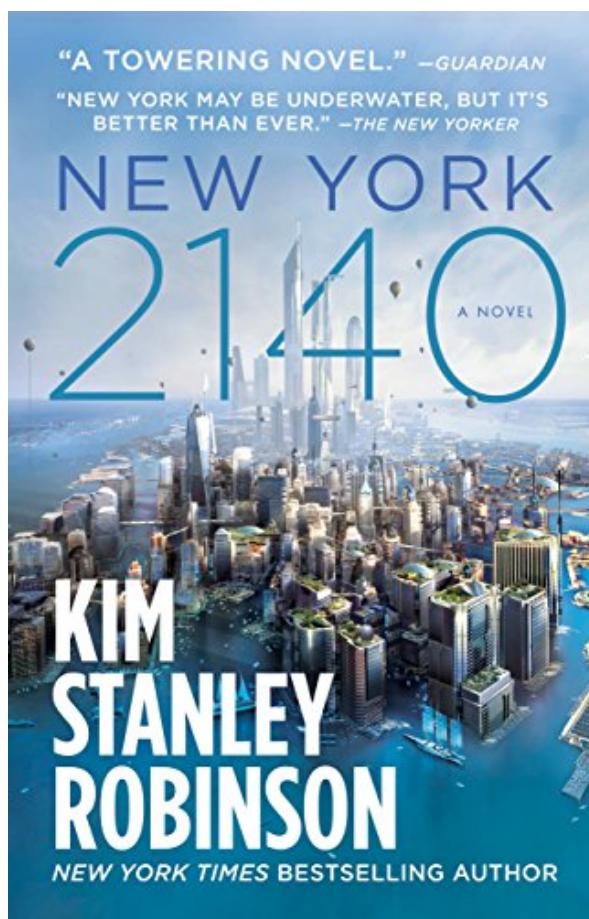
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Q: It is not just at the general level of societal transformation that your work exhibits curiosity about alternative ways of living together. There is the emphasis on bodily exploration of landscapes—Antarctica or Mars—but also the flood-scapes of New York or the forests around Washington D.C. On Mars, some people begin making a living simply running across the terrain, while others take to extreme forms of skydiving. In *2312* (2012), Swan Er Hong is bodily modified with bits of bird and bits of alien. At the collective level, we meet dancing Sufis on Mars, Tibetan monks in D.C., and sexual experimenters traveling dark ships in *2312*. The examples are very different, but each seems to involve simultaneous bodily and spiritual experiments with figuring out how to live well. Can you give us your thoughts on these experiments in subjective and collective living?

KSR: I guess these are all interests of mine. Possibly they're part of living one kind of California life.

When I was young the ocean was my salvation, and I still love the feeling of swimming in the ocean and body-surfing waves. Later I moved away from the coast, and discovered the Sierra Nevada of California, and backpacking up there has been one of the central joys of my life. At this point I've spent more than a year of my life up there, in all seasons of the year, and I hope for more.

Then, because I was young in the 1970s, there was a social scene that I didn't choose but was part of by the timing of my life, which famously included "sex, drugs and rock and roll," also Buddhism and other kinds of spiritual seeking. Gary Snyder was crucial in that latter part of things for me, as was Ram Dass. So, I enjoyed all those things just as an aspect of enjoying youth and my generational cohort. In particular I would say women my age, in the 1970s—they were bold. They were a real force, and second or third wave feminism was a really transformative thing, good for everyone involved, women most of all, but therefore of course men too. Now we tend to take those advances for granted, or forget them outright.

As I got older and moved to Davis my life settled down to include family life and parenting, also pool swimming, distance running, and gardening. And by a lucky chance, my wife and I moved into Village Homes in Davis California, which is a kind of hippie-inflected experiment in suburban communal living, an alternative to typical suburban life, which has included some communal harvesting events, and small-scale village governance.

Lastly, having written about Mars, I arranged to visit Antarctica courtesy of the US National Science Foundation, and how people live and work in Antarctica became as interesting to me as the icy continent itself. It's some kind of scientific utopia being

enacted down there, like a space station on the ice, so that's been very interesting to watch and be part of.

It's all combined to make for my own set of interests, habits, experiences, and values. So, as a science fiction writer, it's always seemed to me that a potential weakness of the genre is its abstract quality, the way it can come mostly out of theory and out of previous books, rather than from experience. I felt I could counteract that potential weakness by writing out of my experience as much as I could manage, given that I was always working under a compulsion to put my stories in the future. So, to a large extent, focusing some of my writing on these matters of life and body was an aesthetic choice to help make my fiction more vivid. They were simply things I had seen or done, so that I could write about them more accurately.

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Q: Let us move on to something rather different. Once Asli suggested that an undergraduate who had trouble getting into Latour's actor-network theory should read your novels. The reason was that your books always beautifully describe the interconnectedness of environment, society, technoscience, and bodies; always taking time to explore how transformations in any domain (planetary, technoscientific or societal) come to permeate every aspect of life, and so triggers more transformations. Now in some sense, your world building is strikingly non-anthropocentric; in that it even resembles deep ecology. But as we talked above earlier, your wariness of purity and your view of technology means that your position is quite different. So, can you tell us some more about how you see the relations between living and non-living things, environments and societies?

KSR: I'm persuaded that ecology is the science most adaptable to the study of interactions of large numbers of living beings. Sometimes I joke that I'm a shallow ecologist, because deep ecology is too deep for me. But really, I just mean that it seems right to say that everything connects to everything else, making it very hard to isolate factors in ways that can get you anything really definitive in the way of big generalizations. I know physics has made incredible progress in describing reality, and also that all other processes in the real world have physical causes, but once you scale up to the mesocosm level of Terran biological and human sociological interactions, you can't isolate factors and do science in the same way physics does, so you have to make observations and explanations that are multi-variant and hard to say anything definitive about. Maybe this is part of my speaking against purity as such—how can you be pure in a world that is necessarily a mongrel construct? I don't see it. For me it's a matter of experiments and improvisations, and getting along as best we can given the situation we're in. In that effort, there's no reason to be anti-technological; as I said, humans are a technological species from the start. It would be better to de-strand whatever it is you're objecting to there, and figure out what you're really objecting to, which often turns out to be capitalism, or sometimes the second law of thermodynamics.

Q: Here we can perhaps return to our previous conversation about your STS inspiration to clarify how you treat science, society and politics. You basically exhibit a deep respect for the achievements of science, yet critique has also been an important dimension of STS, which has analyzed military-industrial funding biases, flawed notions of objectivity ("views from nowhere"), submerged sexist or racist ideologies, and so on. These topics are rarely touched upon in your work. An example is Frank, one of the quirky protagonists of *Science in the Capital*, who is a hardcore socio-biologist apparently unaware or indifferent to the controversies that field of knowledge has been mired in for decades. His belated realization that not everything may be explainable in terms of selection pressures and mating games is contingent upon his

running into Tibetan monks! So we wonder to which extent you feel it is important to critically differentiate between sciences and their claims to knowledge.

KSR: Frank is a particular character, a type that I've often encountered in the sciences, convinced that his own "scientific" explanation is the best description of reality, including human realities. It's basically a comic portrait, and Frank learns a lot of lessons through the course of that novel, some of them the hard way. Running into Tibetan monks is a fortunate accident for him, but he pays attention too. Same with falling in love. Running into the security state, and living with homeless people in America, provide him with some even harder lessons. All in all, I think Frank proves to be pretty adaptable, given where he started.
Leo's plot in *Science in the Capital* is also important for showing how the profit motive distorts scientific work.

I want to add that my novel *The Gold Coast* (1988) is explicitly about the military-industrial complex and its funding issues, including applied R&D for projects like Star Wars, and I don't want that novel forgotten as an important part of my work, because I don't think many novels have actually gotten into the guts of the process like that one does. In the largest view of how our society uses science and technology, the E in STEM has to be remembered. Engineers are often given extremely precise and limited tasks to perform, they are excluded from policy decisions, and told what they should do with their part of the scientific method. How often do novels remember that part of things and try to write fiction about it? It's probably another aspect of contemporary life that science fiction is best equipped to write about, and I gave it my try in *The Gold Coast*.

Then in *The Years of Rice and Salt* I wrote quite a bit about the submerged racist and sexist ideologies in science, by estranging the social contexts of science, but keeping these issues, as inevitably they must be kept; they were foregrounded in the ninth chapter especially. *Antarctica* also describes biases in the practice and funding of science, as does *Galileo's Dream* from its historical perspective. So I don't agree when you write "these topics are barely touched upon in your work." How science emerged and is now practiced is a perpetual concern in my work. I try not to idealize science, even though I valorize it. I think of it as the best politics we have now, the best praxis. You can have both valorization and critique by deploying features of the novel such as conflict, plots, and characters.

Q: Your books often thematize what role science can and should play vis-à-vis politics. And the recurrent question seems to be: is it possible to be at once situated amidst power and still induce potentially needed change, or is there really no way but to go rogue, like the saboteurs in *Antarctica*, for example. You have referred to the current

period of inaction against climate disruption as 'the dithering,' and arguably organizations like the NSF and the IPCC are contributing to this 'dithering' simply because they are required to operate and communicate very carefully, as they are located within the system. Meanwhile, 'fast science' proceeds in the bio-knowledge economy with little impediment, a development that has led to calls for a slowing down of science from within STS and related fields. The importance of slowing down rather than speeding up is also brought up as a warning against pursuing terraforming as a response to climate disruptions in the years to come. How do you think of these relations between the freedom of the outside and the constraints of the inside, and of the importance of slowing down or speeding up?

KSR: This is the "science versus capitalism" problem that I tried to indicate with my title *Science in the Capital*. If you de-strand science and capitalism, despite their emergence as conjoined twins of a sort, and say science is a force for good while capitalism is a force for evil, to be extremely Manichean about it for heuristic purposes, then you are confronted with this problem: science, to work as a process of discovery, needs to maintain some kind of "objectivity" and disinterestedness in terms of what it finds out; whether we like gravity or not, whether we like death or not, they are real. Science in some senses wants to discover the details involved, without denial or enthusiasm as to what is found.

But then we're in a historical moment where the excesses of capitalism, and also, to a certain extent, the successes of applied science (public health, medicine, engineering), have combined to create an unsustainable relationship between our species and our planet. Capitalism doesn't care—it has only one directive, which is to maximize profit and shareholder value and thus increase the power of capital and capitalists. It's a too-simple algorithm, which is now driving us all into a mass extinction event; it's yet another example of *monocausotaxophilia*, the love of single causes that explain everything.

Science has a much more complex axiomatic or determinative algorithm or set of algorithms, having to do with understanding physical and chemical and biological processes, thus increasing human power and reducing human suffering; these goals lead among other actions to attempts to study societies and ecologies and political systems, and many other complex systems, using the same or similar methodologies as the science that is applied in physics and chemistry. There's an implied goal in science, to add to human power and to decrease human suffering; these are either derivative effects or preliminary axioms, but in any case, they are philosophical or ethical matters that lie outside the scientific method itself, they are the why driving the how.

So, "slowing down science" is not at all the right way to put it. Scientific institutions are always working to improve science as a set of methods, especially since the hubristic disasters that followed World War Two, when the scientific community let the winning of that war go to their heads. Since then, a more cautious and modest program has included looking for ways to improve the scientific method. As part of all that, the more we know, the more we may be able to act on behalf of humanity and the biosphere of Earth. So in fact "science" should always be trying to "speed up," at least in its understanding. Maybe in applications that one finds in engineering etc., there should be some slowing down, yes. But here we're slipping around between science as science and science as a word for STEM.

After we learn new things, what should we do with what we know and what we're learning? That's what your question is referring to, I'm sure. There we are talking about law, and about the nexus of politics and economics that results in a power dynamic of some humans over other humans and over the biosphere. Powerful people trying to use scientific results to maximize profits no matter the costs to people and biosphere—they definitely need to be "slowed down." As in disempowered and in some cases jailed. The economist John Maynard Keynes called this "the euthanasia of the rentier class," an ominous-sounding phrase for someone as moderate at Keynes, but he definitely said something like this. In any case, the problem of what to do with our science is not a question internal to science or even to STEM practitioners. It's a political question or a philosophical question, with answers that begin in philosophy and quickly turn into political economy. In our moment, we have to invent and institutionalize some kind of post-capitalism. Science can help us figure out what to do about this, in the disciplines of sociology, anthropology, information technologies, behavioral economics (to the extent that this field is a science) and all the other human sciences. But after science clarifies our options and creates new tools, it's up to us in our political processes to make it happen, and that means forcing some of these changes through, because there will be resistance, as we can see already. People with power and privilege will fight hard to keep the situation as it is, no matter how destructive it may be. So please always consider science to be a set of practices that, powerful as they are, can be turned to various purposes good or bad by aspects of human social life that lie outside the sciences per se.
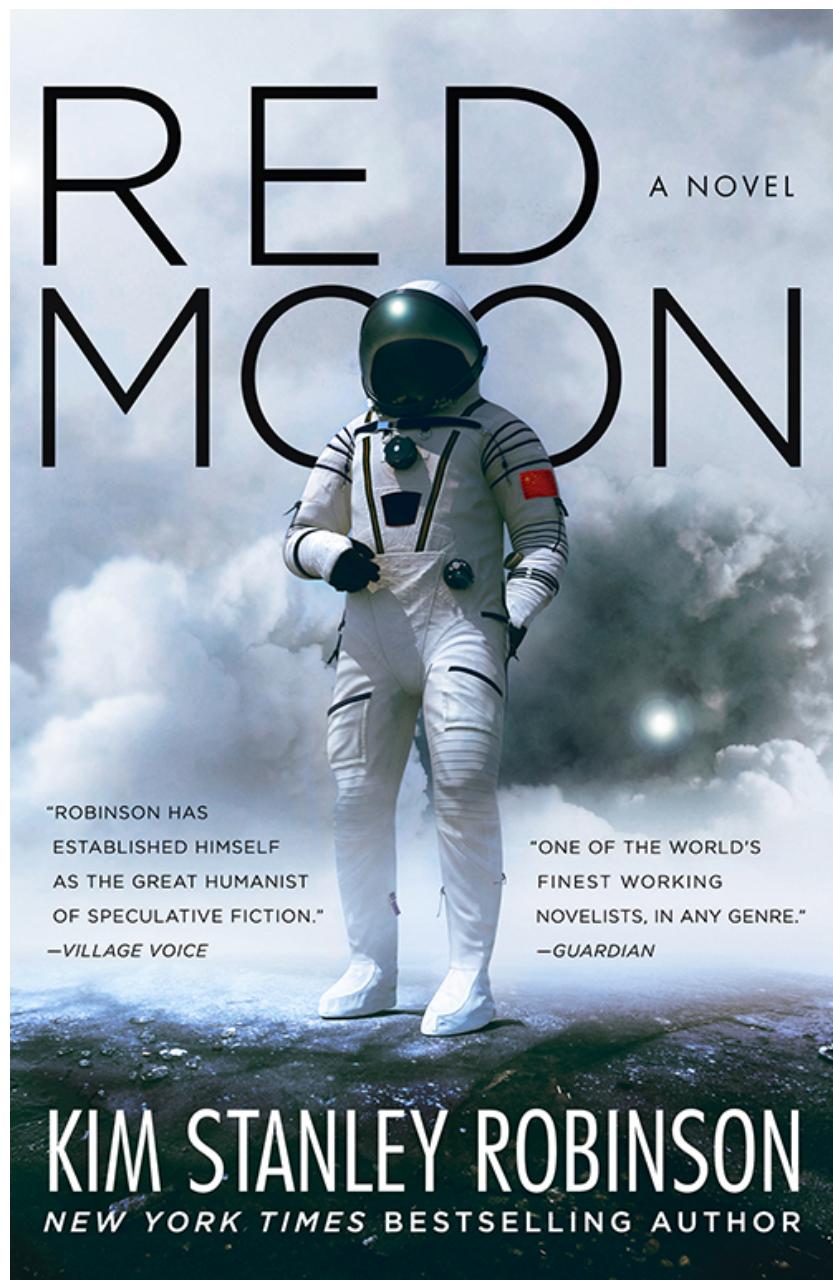
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Q: Let us move on to discuss some aspects of your newest novel. The brand new *Red Moon* (out October 2018) has a strong emphasis on high-level intrigue and power games, especially among Chinese political factions. So an immediate question is what accounts for the very prominent role played by China in the book?

KSR: I wanted to write about China. I had had a marvelous experience writing about historical China in my novel *The Years of Rice and Salt.* This followed on a lifetime of reading Gary Snyder's poetry, and lots of Chinese poetry in translation, so I'm sure

my interest began with that reading. A class at UCSD on Chinese landscape poetry, taught by Wai-lim Yip, was an early strong influence on me, which, along with reading Snyder, led me to Buddhism. It was even a factor in my attraction to the Sierras. So these Chinese texts were central concerns and influences, and when I wrote my alternative history, I took in so much Chinese history that I felt I knew the place.

So, after all that, I thought I would try writing about China in the near future. That combined nicely with my desire to set a book on the moon, a move which would complete my exploration of the solar system as a story space. The two seemed to fit together, as I am quite sure the Chinese will soon establish a human presence on the moon.

What I found in the writing of my book was that present-day China, not to mention China in the near future, is very difficult to understand. The more I learned, the less I understood. Some Chinese friends told me this was the correct response, and that was reassuring. Visiting China for the first time helped quite a bit also. I reconnected with a Chinese friend from my graduate student days, and he introduced me to friends and colleagues and students of his. Thus I briefly saw Hong Kong, Beijing, and Shekou, a port city across the bay from Hong Kong. These short visits helped me, in that I at least saw some things for myself, even if on a superficial level. I had impressions of my own to put into my writing.

Ultimately when it came to the question of me writing a novel, I found that China was too big while the moon was too small. Some good choices concerning point of view and other formal aspects of the novel allowed me to find my way to a story I like, despite these problems. In the end the characters made it for me. And despite my lack of understanding, I retain a lot of interest in and affection for China and its people.

Q: Leaving aside the more detective-oriented and action-packed dimensions of the (very exciting) story, we were struck by the (gradually emerging) depiction of a situation in which 'common people' in China and the U.S. suffer from a more or less similar set of unjust structural conditions, which eventually lead to simultaneous popular revolutions and demands for change, pertaining especially to the economic situation (and the notion of reorganizing society based on co-ops, which was also prominent in *New York 2140* appears again). Can you give us some background for this story-line?

KSR: Yes. It's clear we're in a global capitalist economy, and for most people that means either being in the precariat, or worse, actively suffering from exploitation and immiseration. The system is worldwide, and working populations in all countries

suffer it. There are differences between China and the US worth discussing, and that's one part of what my novel does. The scholar Wang Hui (2014) writes about a "crisis of representation," in which everyone on Earth, no matter their form of government, has to wonder if they have any real political representation, or whether global capitalists have bought the legislating and ruling apparatuses everywhere. It's an open question and one of the big stories of this century. So, I've been trying to make my novels explore these issues, to see what happens, which is to say, what I think could happen, given a desire I have that good things should happen.

There are all kinds of inputs to this project, but an important one is a group of radical economists I ran into about ten years ago; these people been helping me think the particulars of how a "householders' union" could seize power from finance and shift it back to people.

Q: We would also like to touch upon the role of AIs, which turn out to play highly important roles in both *Aurora* and *Red Moon*. In *Aurora*, the AI simply known as 'the ship' has been instructed by the scientist Devi to continue to 'learn to learn,' in order to be able to act against the wishes of the ship's population, should the latter turn self-destructive. And over the course of the book it gradually gains intelligence and self-awareness. *Red Moon* features a Chinese AI, which has been trained to try to make itself smarter at analyzing the country's changing political situation. Eventually, it seems to be the AI that manages to construct a kind of political platform that integrates the apparently incongruent attitudes and demands of the rural masses and the urban intelligentsia, thus creating the possibility for actual political change. In both cases, then, AIs are learning entities whose capacities come to exceed that of their makers. But you are not telling stories of AIs turning against humans, but rather ones in which they operate benignly behind the scenes to better the condition of people. Do you see this similarity between the books and can you offer any reflections on it?

KSR: Yes, I think that similarity exists.

I was very dubious about the possibility of any real "machine learning," but we have clearly seen some limited examples of it in games like chess and go, and there is real excitement among computer scientists I've talked to about the potential of quantum computers. If we get quantum computers that are really much faster in certain kinds of operations than classical computers, and if the algorithms written by human programmers prove to be clever enough, these computers might come up with very interesting things. It's highly speculative, and we may never get a handle on what kinds of inputs to make to get useful outputs from quantum computers. But I've come to think that the Turing test is a low bar—we may soon come to a time when

computers generate sentences that resemble human thinking enough to fool a human judging the source in ignorance. Then, even if there is no sentience there doing the thinking, but rather just algorithms generating grammatical sentences, what follows could still be useful, or at least entertaining.

In *Aurora,* this is taken much further than in *Red Moon*. In *Aurora* the AI is asked to write a narrative, in effect to write a novel, which struck me as funny. I also found it funny that this effort seemed to lead to the AI's decision to intervene in the human conflict going on inside it, as a kind of sheriff. That was quite a decisive step for an AI, but after being asked to "make a story" of events, I thought the AI might easily slip from sentences to acts, which after all in some philosophies are already the same thing. In *Red Moon*, I stuck to that first moment where the AI fumbles toward agency in the world, still very tentative and confused. The AI in *Red Moon* is much simpler than the one in *Aurora*, but I'm interested in that first moment too.

I used to be an AI skeptic, but then I thought, what do I really know about this? Nothing; I'm basically just judging sentences uttered by other people for their plausibility as science fiction stories. So, I've tried, since having that thought, to listen to some of the people on the cutting edge of research and experimentation in this regard. Some of them doubt we can even get self-driving cars, and fear another "AI funding crash" following over-hype, as in the early 1970s. But even these skeptics are doing the work, so I think it behooves a science fiction writer to pay attention and at least consider some ramifications, without falling into old cliches.

Q: If you don't mind, we have a bit of an AI 'bonus question' relating to *Aurora's* narrator, 'the ship.' The way in which this entity gradually learns to have a self (or selves as it/they prefer "we") over the long course of the round-trip to Tau Ceti is very thought-provoking. Yet, the story ends with the self-sacrifice of the ship, even as it saves most of its passengers. Now the trope of artificial beings giving themselves up for humans is quite common in SF, and the image is one where the AI basically proves its humanlike qualities by self-sacrifice. Still, it might be said that there is something slightly odd about the level of altruism so often demanded from AIs. Why does the ship, which has evolved into such a unique being, have to die at the end of the trip?

KSR: It just happened that way. I wanted the starship's slowing down in our solar system, without enough deceleration fuel to do it easily, to be a very close-run thing, as it would certainly be. In that struggle to stay in the system, running out of fuel seemed kind of inevitable. Then the only question was, could the humans be dropped off on Earth successfully. After that, a really tight turn around the sun might have saved the day, but it didn't work. So, it wasn't so much self-sacrifice as trying to have

it all, with the safety of the humans as an overriding imperative, a kind of axiom for the ship.

I suppose it could have happened that the ship managed that last turn successfully and kept itself inside the solar system and become a kind of nurse that its human passengers had outgrown, or a place they could return to if Earth got too overwhelming; but I didn't like those opportunities. I wanted the ship's humans to be truly lost on Earth, truly orphaned, to make their return to Earth that much more traumatic.

Some friends suggested to me that the ship could have just sailed past the sun without getting close, and flown off into the universe. But it only had enough nuclear fuel to keep it going for a couple hundred more years. Everything dies, so it would have died too. That might have been even weirder as a fate. I wonder, if it had occurred to me while writing, if I would have chosen it. But it never did occur to me. And truthfully, it feels odd to speak about choosing the incidents in my plots. I know it must be true that that happens, but it feels more like these stories just happen to me, like dreams do. I'm not a lucid dreamer; my dreams seize me. And my novels too.

Q: We would like to end by considering some broader issues, not least relating to climate disruption. Science fiction has of course dealt with environmental issues for a long while. Recently, work with this orientation has received its own designation—climate fiction. What do you make of this? Does it indicate, for example, a kind of formalization of an emerging genre (controversially said by Amitav Ghosh in *The Great Derangement* [2016] to not exist, or at least not having been taken seriously so far)? And, what, if anything, do you take to be its importance?

KSR: I'm suspicious of this term "climate fiction." It strikes me that every time science fiction hits a nerve in Anglo culture, someone tries to give it a different name, often to make it seem more respectable. In the sixties it was speculative fiction, in the eighties cyberpunk, now climate fiction—no. To me it's best always to call it science fiction, and thus include that whole tradition, with its immense power and also its outlaw status as pop lowlife entertainment. That split into high art and low trash has long since been shattered in the postmodern turn, but insecure people still hold firm to it—there is a desperate middlebrow culture that is still clutching at the highbrow-lowbrow split, you might say, in order to be able to make distinctions easily, and feel accomplished and superior. But science fiction has always transcended that split, and now it's the realism of our time, the genre that matches our historical moment, in the way that the epic fit classical times, and the stage play Elizabethan England. So, despite the mark of Cain put on sf in that older modernist structure of feeling, I think science fiction needs to stay proud and insist on its value, in part by keeping its name

through all its permutations, and its applications to new historical developments. All stories set in the future are science fiction by definition, no matter their particular content.

Amitav Ghosh is an excellent writer, so it's too bad he wrote in ignorance, and with what seems like his own unrecognized snobbery. Ghosh should have just written a science fiction novel and tried to solve his own perceived aesthetic problem. He might have found that there are still some stories to tell.
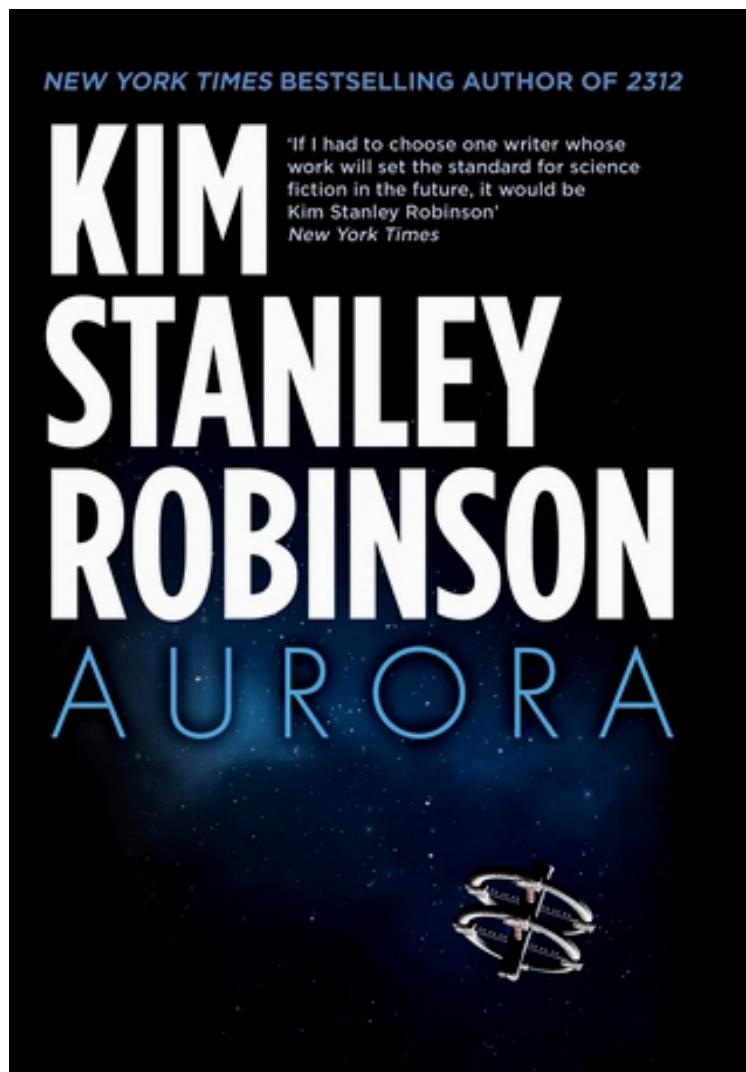
Courtesy of Hachette Book Group

Q: One of the challenges faced by writers that want to depict slow environmental degradation seems to be temporality; the fact that e.g. climate change generally occurs at such a slow pace that it is quite difficult to narrate except, precisely, by rendering the change sudden and catastrophic. The literary scholar Rob Nixon has written of

an environmental slow violence "that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space").[3] Can you tell us about your strategies for solving this narrative dilemma and for compressing the long and not-so-spectacular destruction of Earth in ways that make it perceivable and relatable within the context of particular peoples' lives?

KSR: It's a real problem and I don't think anyone can completely solve it, certainly I haven't, but there are things that one can try, and I have. Although the novel's natural temporality seems to cover a lifetime at most, there can be exceptions where a form is invented to span more years. Gabriel Garcia-Marquez is a model here, and Olaf Stapledon showed how a novel could morph into a kind of prose poem covering centuries even. More normally, in terms of form, it's possible to locate the moments when things crack, and my *Green Earth*, the *Science in the Capital* trilogy, does that by describing one potential tipping point as it tips, so that there can be drama in the usual novelistic way. I think James Bradley's *Clade* (2015) was very good at portraying "slow violence" by way of a few generations, each dealing with some kind of climate shock, making them into refugees more than once, in which a sense of family is improvised over the generations as a human necessity and accomplishment. So, some novelists are trying to find ways to use the form to express this new content. It will always be a problem, but to an extent it's a problem that has always existed for the novel, which in the nineteenth century often wanted to describe not just individual lives but these individuals' relationship to their society, with history happening either on stage or off, as the macro-plot of the novels. Aspects like these of the pre-modern novel can be very useful to us in the postmodern or Anthropocene period.

Q: By way of ending: We've already talked quite a bit about the relation between science, technology and the possibilities of socio-political change, not least in light of climate disruption. We know that some of the world's richest and most powerful people including Jeff Bezos and Elon Musk are influenced by particular kinds of science fictional imaginaries. What do you think of the relation between authorial intentions and the wildly different interpretations and meanings the text gains after being unleashed in the world (one might think of Musk's understanding of the works of Iain Banks…)? In some ways, it seems clear that SF has significant power to shape discourses on technoscience and our future. What—and perhaps 'how much'—do you think SF has the capacity to accomplish in this regard? And, finally, given these powers of SF writing, do you yourself feel a certain weight on your shoulders as you sit down on your porch to start writing?

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[3] Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, MA: Harvard University Press, 2013). 2.

KSR: I think science fiction, being made of stories set in the future, has an inherent power that can be used in helpful ways. I think all science fiction taken together (or as much as any one reader or viewer can take in) leads to a kind of rough consensus, which gives people a feeling of historical trajectory toward one kind of future or other. Then events in the real world, and new science fiction stories, either fit into that feeling or they contradict it, in ways that can be put to use, and those stories will then change the feeling and the trajectory, or just get rejected as being implausible or whatever. So, in that process, science fiction can function as an aid to cognitive mapping, you might say. It gives a strange kind of fictional historical perspective on the present, and on where we might be headed. It's not that different than the function of all the rest of art in our lives, but it does have that future-oriented aspect that gives it an extra power.

I feel my writing now mostly as an opportunity, as a novelist with an audience of readers who are typically very generous in giving my books their time and imagination. A novel is a shared project between writer and reader, very strange when you think of it, and very satisfying to feel when on either side of the action. Because the novel is a heteroglossia, a polyvocal exercise in which the novelist choreographs things that everyone is already feeling, the power of any novel is limited—it has to fit the zeitgeist somehow to be read at all, and then it exists as part of a complex feedback loop, and may not so much make change as express it.

So, as I've come to see that more clearly, my attitude has changed. When I was younger I felt science fiction's potential as a weight on me, yes. Now I'm more relaxed. I roll the dice and see what happens.

I miss Iain Banks and Ursula Le Guin. With them gone, being a utopian science fiction writer feels more lonely. But their books, and the memory of them as people, still gives me a lot of pleasure and encouragement, and I forge on with the hope that younger utopian writers will appear in their time and carry on with the project. There are utopian stories to tell, and we need them.