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Science AMS Series: We're Andrew Merrie and Simon Stålenhag for the Radical Ocean Futures #ArtScience project, ask us anything!

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[1]Affiliation not available

April 17, 2023

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Simon--I've been obsessed with your art for the past year. I wish I would have been introduced sooner! Have you ever considered collaborating on a comic series or video game? Every time I see one of your futurescapes I want so desperately to be able to immerse myself more.

dwall932

SIMON: Hi dwall932. Thanks for obsessing! The idea of comic series or video games have crossed my mind, but I'm really happy with the format of my books, where I also get an outlet for my own writing. If the story is right I would never say no to teaming up with someone, but I'm not actively looking for a writing partner.

From a hydroclimatological perspective, what's been the largest change of the past 100 years? What do you anticipate being the biggest change of the next 100, assuming the course we are on?

SunTzuIsMyFavourite

PAT: a. During the past 100 years, I reckon the biggest changes have been in how humans have modified the land surface of the the Earth. This has had profound implications for surface water changes, the severity of floods, and has potentially even altered the atmospheric hydrologic cycle.
b. In the next 100 years, I expect that the most significant changes will be in hydrological extremes. For example, floods will likely occur in places that have never experienced events of certain magnitudes (amount of water) and duration (how long the water sticks around). These extremes will likely include impacts to droughts as well as floods. The second most severe impact is likely going to be migration of ecosystems towards higher latitudes and higher elevations to cope with increased temperature stress from climate change generally and changes in storm tracks due to interactions among polar and tropical circulation changes.

Art Science sounds fascinating. What are some simple steps to take for those who aren't as artistically capable, but still want to help the Oceans?

Archer2408

Great question. Andrew Here. I was fortunate enough to be able to commission Simon to try and provoke different kinds of discussions about the future of the oceans. However I understand that it is a

unique privilege to be able to collaborate with artists and musicians. If we are thinking about things you can do to help the oceans, there are lots of ideas. You could get involved in cleaning up local beaches, work on reducing plastic waste from yourself and family and friends. Be careful and conscientious about the seafood you choose to eat. Another great contribution is working with organisations that promote marine protected areas and other types of solutions that create buffer zones and breathing spaces in the oceans for marine species and ecosystems. A lot of the challenge that we see facing the ocean is the speed of the change so anything you can do either directly or indirectly to help relieve the pressure on marine ecosystems will help. I can put together some links and resources to provide you more concrete ideas

Art Science sounds fascinating. What are some simple steps to take for those who aren't as artistically capable, but still want to help the Oceans?

Archer2408

Hey Archer2408, Andrew here. here is a link to the voluntary commitments which is totally worth exploring for some awesome ideas about how to make a difference for the oceans:

https://oceanconference.un.org/commitments/

Andrew & Simon, thanks for doing this AMA.

I've heard of scenarios where jellyfish dominate the oceans after a collapse of most of the fish stock. Is this something you have looked at? A world 50-100 years in the future with jellyfish?

helm

Hey Helm! Andrew here. We had very much the same thought. In fact, that is one of the main plot points in the 'Fish Inc.' sci-fi scenario that you can read on the webhub! here is a direct link: https://radicaloceanfutures.earth/fish-inc/ In this story, the idea is that jellyfish and lanternfish or myctophids (small mesopelagic fish) dominate the oceans and are processed into protein pastes by the firm Fish Inc. this is somewhat extreme but there is certainly indications that in an ocean with lower oxygen levels, jellyfish populations will swell. Thanks for the question!

Andrew & Simon, thanks for doing this AMA.

I've heard of scenarios where jellyfish dominate the oceans after a collapse of most of the fish stock. Is this something you have looked at? A world 50-100 years in the future with jellyfish?

helm

Hey helm, Andrew here. Here is the classic paper that proposes 'jellyfish deserts' they call it the somewhat hilariously named 'jellyfish joyride' - http://www.cell.com/trends/ecology-evolution/abstract/S0169-5347(09)00088-3

Thanks for being here! Can you share some specific examples of art or science fiction that has helped people understand real science better?

p1percub

SIMON: Contact by Carl Sagan is great fiction based on the authors substantial knowledge and insight into the subject. As for pure art, Wayne Barlowe's art of extra terrestrial landscapes and creatures are truly magnificent and also based in real science. However I'm not against softer science fiction either, I

think the key role in art's relationship to science is to spark the imagination and sense of wonder.

Thanks for being here! Can you share some specific examples of art or science fiction that has helped people understand real science better?

p1percub

I would also say that the Mars Trilogy by Kim Stanley Robinson has been very powerful in the context of getting people inspired about space travel and the degree to which flying to and trying to get established on Mars is a truly monumental challenge

Thanks for being here! Can you share some specific examples of art or science fiction that has helped people understand real science better?

p1percub

SIMON: Also, I think it is an interesting side note that Johannes Kepler, one of the first real astronomers, who in 1608 also wrote some of the first science fiction with his book "Somnium" which dealt with a journey to the moon. I think science, art and imagination all comes from the same place in our brains, and it's their method of execution that differs, not the conception. I think they're both a way of trying to dissect the world, inspect its pieces and putting them back together in new configurations.

Thanks for being here! Can you share some specific examples of art or science fiction that has helped people understand real science better?

p1percub

PAT: One of the most exciting aspects of science fiction to me is how it ignites the minds of people to think about humanity, technology, and the future in new and different ways. Neuromancer (by William Gibson) got people to think about the future of networked computers, iRobot (by Isaac Asimov) challenged people to consider whether and how robots could be ethical, and Jurassic Park (Michael Crichton) brought up issues of biotechnology and the limits of what humans can (and should) do. I think these science fiction works get people to learn about things they might not otherwise learn about (e.g. how many people learned about Chaos theory from Ian Malcolm… for better or worse), but to also get excited about new frontiers of how humanity embraces technology.

Thanks for being here! Can you share some specific examples of art or science fiction that has helped people understand real science better?

p1percub

ANDREW: Hi p1percub. In case you missed it, I also wanted to share with the the piece I wrote recently for Rethink magazine where I discuss a number of cool initiatives in this space: https://rethink.earth/can-science-fiction-reimagine-the-future-of-global-development/

Finally, I actually think that the BBC planet earth series (especially the recently screened Planet Earth 2) are such incredibly beautiful and powerful pieces of visual art that can explain and illustrate what science looks like in motion. I think there is even more potential for tools like VR and AR to connect to science fiction and art to connect people to science in quite unexpected ways. It is an exciting time to be experimenting.

Thanks for the AMA. I would like to know if there are practical ways to stop this deterioration. And can the recently very much discussed Paris climate change agreement would affect the current situation?

arj98

Thanks arj98. Andrew Here. I think that it is interesting to think about the Paris Agreement as one in a suite of treaties, agreements and networks of organisations that together can make a difference to halt and even perhaps reverse the deterioration being faced by our oceans. For example for this UN Oceans conference which is focused on 'SDG 14' one of the United Nations Global Goals for sustainable development, there have been over 700 voluntary commitments registered for people and groups taking specific and diverse actions to improve the health of our ocean https://oceanconference.un.org/commitments/. The potential really lies in the way that the formal agreements create space for actors to rally around and take action. You are right to highlight the Paris Agreement as so much of the challenges facing our oceans derive from climate related impacts whether from ocean acidification, sea-level rise, deoxygenation, changing species distributions or the bleaching of coral reefs. So the system of ratcheting commitments and the acceleration of renewables and transformation of the energy system which is the really exciting part about Paris, that could very much be help reduce the climate related pressure on the oceans. Together Paris, the global goals for sustainable development, the convention on biodiversity, when combined with the efforts of individuals, the private sector and NGOs can together begin to make a powerful difference.

Thanks for the AMA. I would like to know if there are practical ways to stop this deterioration. And can the recently very much discussed Paris climate change agreement would affect the current situation?

arj98

ANDREW: I wanted to follow up on this by sharing a recently published paper by SRC colleagues that looks at the role of Paris in terms of the potential for kicking off radical decarbonisation following a climate equivalent of moore's law which the authors have coined the #carbonlaw. here is a video about the paper: http://www.stockholmresilience.org/research/research-news/2017-03-23-curbing-emissions-with-a-new-carbon-law.html

Simon, I'm a massive fan of both your art and music. Since I'm sure you'll get a lot of questions on your art, I'll ask two questions relating to music: will you ever be producing any more chiptune music? Ripple Dot Zero soundtrack was unbelievable and I can't wait to hear more! Secondly, who do you consider to be your musical inspirations? I noticed a few sections of the RDZ soundtrack sounded very similar to the UK prog band Frost*, I'd love to know if you've heard their stuff, or maybe you drew inspiration from the same places.

Cheers

* This isn't a footnote, the asterisk is part of the band name.

Implausibilibuddy

ANDREW: Just to jump in here on the music question (so cool Simon is also a musician). As part of this #radicaloceanfutures work, I was also able to commission K. La Luna to produce original pieces of music to complement the scenarios and the artwork. Like working with Simon, this was also a fantastically creative and rewarding collaboration. here is the link to the playlist on Soundcloud: https://soundcloud.com/user-957254102/sets/radical-ocean-futures-an

Simon, I'm a massive fan of both your art and music. Since I'm sure you'll get a lot of questions on your art, I'll ask two questions relating to music: will you ever be producing any more chiptune music? Ripple

Dot Zero soundtrack was unbelievable and I can't wait to hear more! Secondly, who do you consider to be your musical inspirations? I noticed a few sections of the RDZ soundtrack sounded very similar to the UK prog band Frost*, I'd love to know if you've heard their stuff, or maybe you drew inspiration from the same places.

Cheers

* This isn't a footnote, the asterisk is part of the band name.

Implausibilibuddy

SIMON: Thanks! The question is not entirely on topic, but nevermind I'll give it a go: I haven't had much time working with music the last two years, but I am working on a very stripped down lofi ambient album that I don't have any release plans for as of right now. My musical inspirations for the RDZ soundtrack was the Gunstar Heroes OST, Sonic 3 OST and all the New Jack Swing era of american RNB in general, Teddy Riley and Michael Jackson in particular, west coast 80s slick adult contemporary sound and how that sound influenced videogame soundtracks of that era. I've never heard of Frost*, I must check them out.

Do you think we should cultivate natural filters like ocean plant life to restore oxygen levels ? It works in aquariums

dragonpeace

PAT: 1. This is partly what fertilization of the oceans might do, in that by adding iron oxide to oceans it can stimulate the growth of plankton that would consume CO2, produce oxygen, and would provide biomass to larger marine life (such as whales). The consequences, however, could be enormous if algae growth gets out of control, as we briefly explored in the “Rime of the Last Fisherman” scenario. 2. That being said, small-scale experiments like this aren’t necessarily bad, as long as the parties involved can agree that its worth trying. That might mean that in a specific nearshore zone that a country, province, or state could decide to try the tinkering you describe. 3. There are lots of legal principles and precedents that would need to be explored and understood, given the complexity of international environmental law.

Hello, which pieces of art of yours do you feel have the most emotion behind them?

_Smatt

SIMON: Hi _Smatt. From the pieces I did for this project I would probably say The Last Fisherman https://radicaloceanfutures.earth/rime-of-the-last-fisherman/ since it's such a dystopic view of the oceans. I really wanted to exaggerate the amount of littering, to have it visually represent a ecosystem in pain but also the sadness of the person the story revolves around.

The project sounds awesome guys! Simon, will your contribution flow from your previous narrative arcs into this watery-future-concept? Or will it be a wholly new realisation?

wetnax

SIMON: Hi wetnax. The pieces for this project is a whole new thing, and each scenario is also more or less stand alone. It was really cool reading these scenarios and discussing their background and in a way this is the opposite approach to what I normally do with my own stories where I first come up with a visual language and then write a story that fits it. For instance, I knew that The Electric State would be set in an alternative mid 90s america with VR helmets, and I did tonnes of sketches with that aesthetic - I just didn't know the exact backstory yet. In this case Andrew already had the backstory and

a very detailed and researched frame for me to work within, and visually I had no preconceptions at all when I started working.

Thank you for doing this AMA!

One tension I deal with as a science writer is that as one moves further from science/data/facts into narrative/art/fiction, it becomes easier to "spin" a certain version of reality, as well as easier to sway people emotionally. What advice do you have for other science communicators of all sorts about how to be compelling and embrace different media, while also staying accurate and grounded in truth?

neurobeegirl

ANDREW: Hey neurobeegirl, this is an issue close to my heart. You are of course right that there is a tension and it is a real challenge and indeed an ethical dilemma to ensure that as we move towards narrative, there is the potential to both present a certain view of the world and also to connect emotionally. Being able to do this is of course a double edged sword as it can be ethically problematic while also being a way to connect to people and get them to care about something in a way that is really hard only with scientific papers. I actually found the science fiction prototyping methodology really helpful here as it requires you to stay grounded in the science. For example, if you check out the narratives on the webhub for #radicaloceanfutures, each of the narratives is intensively annotated linking to relevant scientific papers and credible news sources. In addition, for the scientific paper that is in review, there are a set of extensive supplementary materials that provide a rigourous scientific foundation. So in that sense, the narratives, the artworks and the music provide powerful and emotionally engaging entry points to the science rather than being a replacement for the science or disrespectful of the underlying and critically important data and facts on which the narratives are built.

Thank you for doing this AMA!

One tension I deal with as a science writer is that as one moves further from science/data/facts into narrative/art/fiction, it becomes easier to "spin" a certain version of reality, as well as easier to sway people emotionally. What advice do you have for other science communicators of all sorts about how to be compelling and embrace different media, while also staying accurate and grounded in truth?

neurobeegirl

SIMON: Hi Neurobeegirl. I can only speak from the point of view of an artist and sf-writer, but I think the most important aspect is getting the tone right, so that readers/viewers know by which rules you are playing. Remember Carl Sagan in the very beginning of Cosmos stating "We will not be afraid to speculate, but we will be careful in separating speculation from fact". But for pure science fiction, I also think it is important not to break the tone, or breaking the rules that you set up. When you step into the "fiction" part of it, I think anything goes as long as it feels consistent with its own premise. For my own books I set up the narrative as a recollection of childhood memories so I could say "hey this is only what I remember, and I have no real understanding of the mechanisms behind it, take it or leave it -" and in that way not having to explaining all the tricky science behind it.

Thank you for doing this AMA!

One tension I deal with as a science writer is that as one moves further from science/data/facts into narrative/art/fiction, it becomes easier to "spin" a certain version of reality, as well as easier to sway people emotionally. What advice do you have for other science communicators of all sorts about how to be compelling and embrace different media, while also staying accurate and grounded in truth?

neurobeegirl

PAT: I think this is a delicate balance, and I totally recognize the tension. As a scientist, its risky to go out on a limb and speculate since it could ultimately undermine my credibility as a scientist. However, by “playing it safe” lots of interesting and perhaps necessary questions may go un-asked. Personally, by clearly defining the boundaries of what is empirically based and what is educated-guesswork is how I approach this issue.

A useful empirical framing that I’ve come across that is used to explore whether X effects Y, is called “Can it?” “Has it?” and “Will it?”. For example, this framing been used to ask whether Arctic sea ice loss has contributed to changes in weather over North America and Eurasia (e.g. http://wires.wiley.com/WileyCDA/WiresArticle/wisId-WCC337.html). The three different questions (“Can it?” “Has it?” and “Will it?”) allow a clear and grounded exploration of different types of questions. In “Can it”, its a purely theoretical exploration, “Will it” is based on projections and interaction with other mechanisms (and is often explored with models), while “Has it” is usually the toughest question to answer given that it likely involves observations and demonstration of causality.

In terms of science writing, and making sure there isn’t too much spin, I think its useful to be clear about which type of question/idea is being explored. I’ve read many science stories that confuse a “Can it” question with a “Has it” question, and then the whole article is derailed.

Sorry this is a bit rambling, but let me know if you want me to clarify :) Thanks for the question!

How did you two meet and begin this art-science collaboration?

frenabo

ANDREW: Hey Frenabo. So the beginning of this story is that I was a total fanboy of Simon's work. In the early stages, when I had written the Fish Inc. narrative and was starting to think that it would be so awesome to be able to have artwork to go along with it, I came across Simon's concept art via the IO9 fineart feature. It immediately jumped out at me as something really different and compelling. Simon was able to make the fantastical, relatable. His work could capture the reality and groundedness of a situation even as a great hulking robot was lurking in the edge of an image. I thought immediately, I must work with him. So we meet and discussed the potential for collaboration and fortunately for me, Simon was excited about the opportunity. Finally I managed to secure a Science Commmunications grant from the Swedish Research Council FORMAS as I was finishing up my PhD and that was when I was able to commission Simon and we could start collaborating. so yeah, total fan

How did you two meet and begin this art-science collaboration?

frenabo

SIMON: What Andrew said! I'm such a big admirer of the whole activity of science and I was really intrigued by the modern approach that Andrew had to this project and his ideas about science communication really went hand in hand with my own thoughts on it.

Have you heard of Matt Rutherford and his Ocean Research Project before? From what I know, he's working towards acceptance of sailboats as cost effective research vessels and collecting a lot of data by himself for NASA and the Smithsonian.

Is this the future of gathering scientific data about our oceans or do you see other ways?

And do you have suggestions for cleaning the oceans from plastics?

TheGrandHobo

Andrew: Hey there TheGrandHobo. I have indeed heard of Matt Rutherford and the Ocean Research Project. In fact, I participated in an episode of the 'onthewind' sailing podcast where I talked about the #radicaloceanfutures project and we ended up discussing the role that sailors could play on attaching sensors to their boats to help build out an ocean-wide sensor network for monitoring the health of the Ocean, so the Ocean Research Project came up in that context. Very cool and I think these kinds of distributed citizen science initiatives and collaborations between scientists and people passionate about the oceans are really really important!. here is a link to the podcast episode if you would like to have a listen: https://itunes.apple.com/us/podcast/on-the-wind-sailing-by-59-north-ltd/id711410636?mt=2

So this is one way for sure. In one of the scenarios, back from the brink, we imagine thousands of autonomous drones governed by swarm intelligence and patched into a sentient AI moving around the oceans gathering data and restoring ecosystems, but that is a bit further off in the future...https://radicaloceanfutures.earth/oceans-back-from-the-brink/

Plastics is a difficult one. Again fleets of ocean going drones collecting and breaking down plastics could be one option. I know right now there is a lot of excitement about the potential of the Wax worm for being able to break down plastics: http://www.npr.org/sections/thetwo-way/2017/04/25/525447206/a-worm-may-hold-the-key-to-biodegrading-plastic. In the end it will have to be a combination of reduced plastic being put into the ocean via different packaging materials and reduced waste and technology will play a supporting role.

Have you/will you guys do any work involving ocean acidification and how it messes with fish/marine animal behaviors? I think this is an important topic when thinking about ocean dystopia because fish, for example, can mistakenly be attracted to the smell of their predators under acidified ocean water, leading to higher mortality rates in a population.

Thanks for doing this interesting AMA!

imoanzil

ANDREW: Really interesting question. here at the UN Oceans conference, there is quite a lot of focus on Ocean Acidification as being a major challenge. To be honest, I am not sure the degree to which there is a focus on how acidification effects the behaviours of fish and marine mammals as most of the focus has been on the impact on calcifying organisms. I will try to follow up on this and chat to scientists here working on ocean acidification and can post any interesting links here. I do know of one paper in biology letters about how ocean acidification can effect auditory behaviours of fish:

http://rsbl.royalsocietypublishing.org/content/early/2011/05/25/rsbl.2011.0293?papetoc=

Hello Simon! I'm the moderator of r/evilbuildings . Just wanna say your work is fantastic and we've featured it on our sub many times on CGI Fridays

Many of those posts hit r/all and I always source your site in the comments spreading the word about your awesome creations!

https://www.reddit.com/r/evilbuildings/comments/5p3vp7/back_to_work_citizen

https://www.reddit.com/r/evilbuildings/comments/5vxi2r/just_a_normal_day_with_our_alien_overlords

https://www.reddit.com/r/evilbuildings/comments/65c3i9/gather_round_now_children

https://www.reddit.com/r/evilbuildings/comments/618xq7/these_mother_russian_casinos_dont_mess_around

https://www.reddit.com/r/evilbuildings/comments/5rty5l/hello_wont_you_come_inside

malgoya

SIMON: Hi Malgoya,

Thanks for the kind words and thanks for promoting my work! That kind of positive feedback means the world to me and it really inspires me to keep on doing what I do!

Can we buy the project artwork in poster form?

pier25

Andrew - Hey there pier25! Let me follow up on this with Simon but I think the best would be to head to his website and follow up directly about purchasing the artworks. http://www.simonstalenhag.se/

Will you guys need additional help moving forward with this project on the "arts" front? Obviously Simon's work (as always) is incredible, but have you considered using 3d animation to bring his work to life?

Toast_One_Seven

ANDREW: Hey Toast_One_Seven - Now that is intriguing. I have considered taking it to the next stage in terms of creating film or animated versions of the pieces or even using some advance parallax effects on the web hub but I have not gotten any further than thinking that it would be a great way to take this work to the next level, especially as we now have the narratives, the art and the music. do you work in 3D animation?