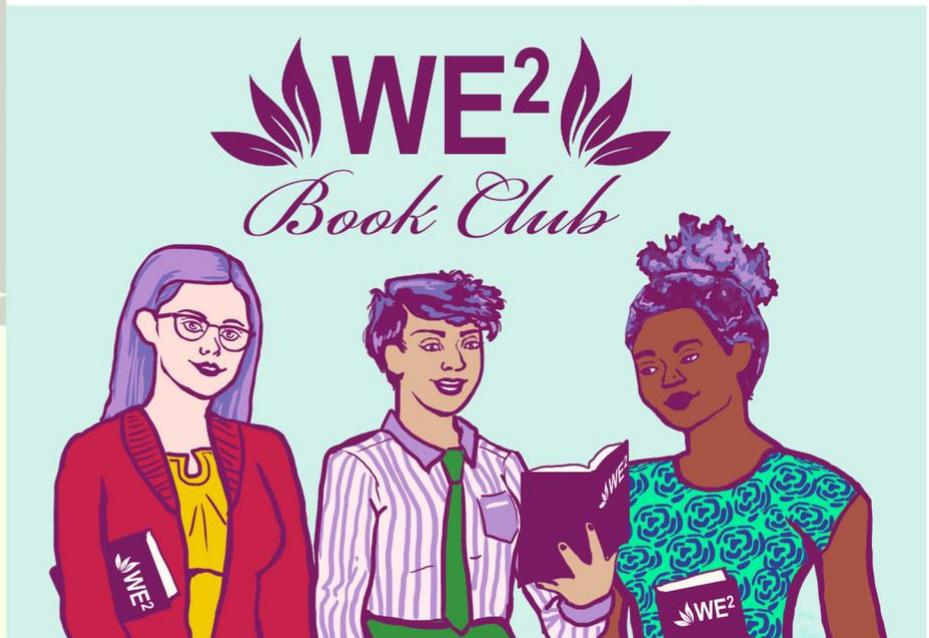
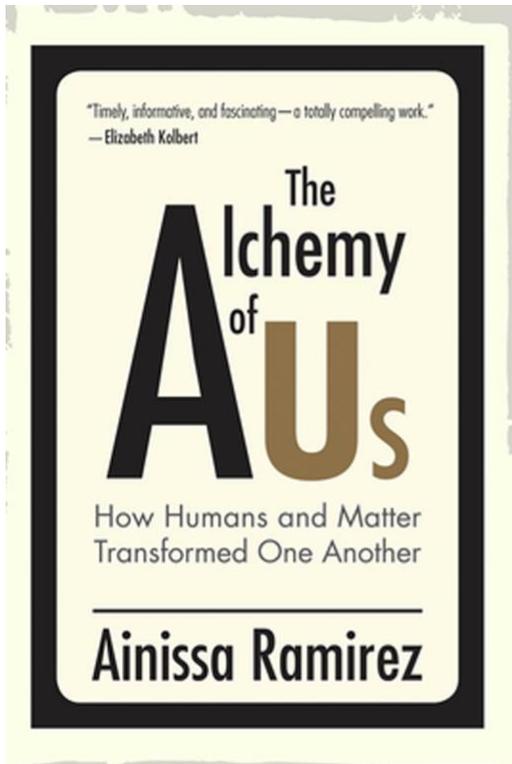


# WE<sup>2</sup> Book Club Discussion Notes – ALCHEMY OF US



BOOK: "[The Alchemy of Us: How Humans and Matter Transformed One Another](#)" by [Ainissa Ramirez, Ph.D](#)  
DISCUSSION DATE: Tuesday March 30, 2021 | 4-5 pm EST  
<https://caes.rutgers.edu/blog-post/alchemy-of-us-womens-history-month/>

## Major Themes and Takeaways from the ALCHEMY OF US:

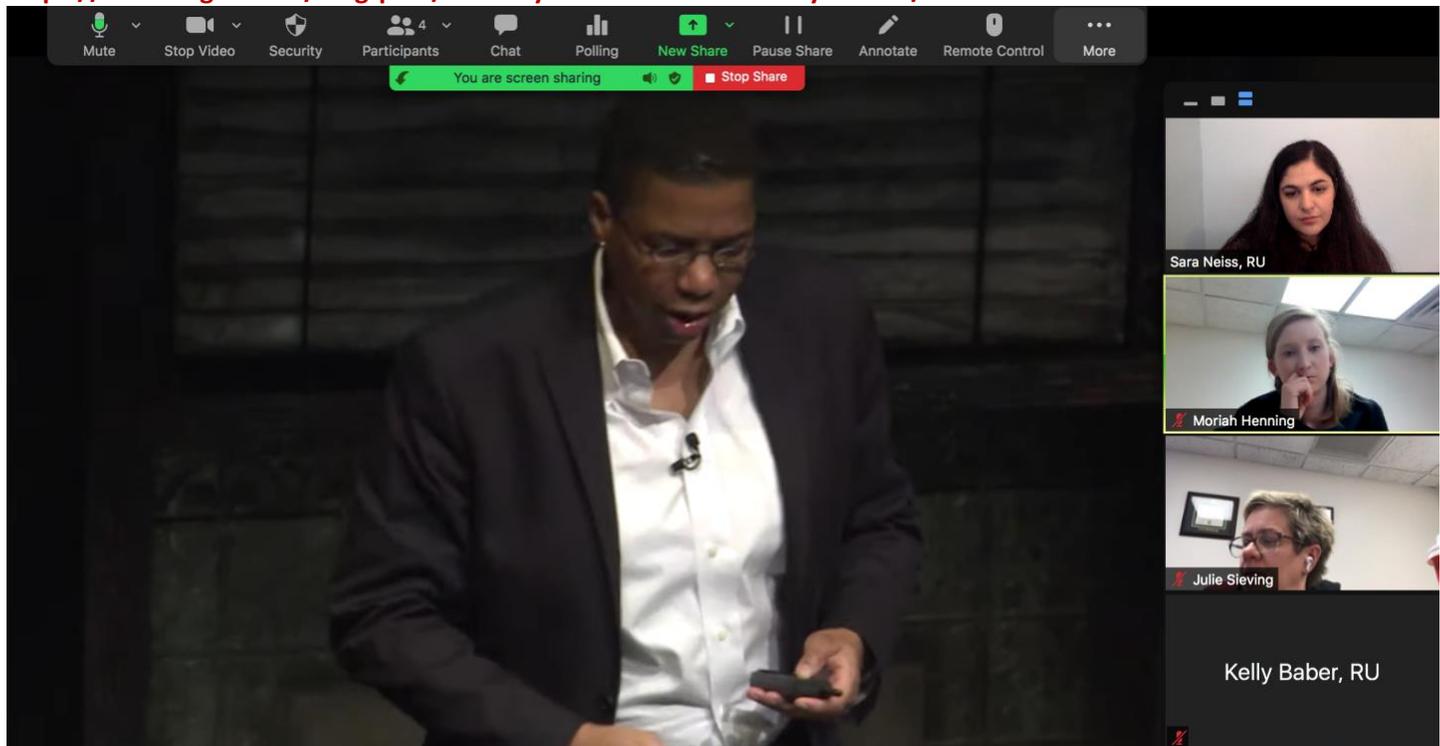
- The importance of interdisciplinary knowledge
- Embracing the combination and influence of different fields on technology
  - Art and science
  - Social and physical sciences
- Technology shapes humans and society and then is reshaped by us in turn
  - "All that you touch, you change. All that you change, changes you." - Octavia Butler, *Parable of the Sower*
- Reoccurring themes of certain technologies through America's industrial revolutions: time, railways, glass
- Historical interaction of social action and technology vs. that between racism and technology
  - this leading to a continuation of problems with newer versions of the technology
  - (i.e. the racism remains in the pixel just as it did in the chemical design of color kodak film development)
- Speed at which we process information but also the importance of giving the mind breaks

## Chapter Summary:

1. **Introduction** – Ramirez’s personal influences from childhood shows (Star trek, PBS 321 with a black girl shown as a scientist, etc.) to glass blowing
2. **Interact** – “how better **clocks** made possible by small metal springs and vibrating gems helped us keep time but also made us lose track of something precious”
3. **Connect** – “how **steel** stitched culture together with rails and how steel helped to manufacture culture”
4. **Convey** – “how **telegraph** wires of iron and later copper gave rise to rapid forms of communication and how they wires shaped information and meaning”
5. **Capture** – “how **photographic materials** captures us in visible and invisible ways”
6. **See** – “how **carbon filaments** pushed back the darkness to help us see but also veiled our eyes from viewing the impact of its overabundance”
7. **Share** – “how **magnetic bits of data** made it possible to share but also made it difficult to stop what is being shared about us”
8. **Discover** – “how **scientific glassware** helped us discover new medicines and helped us discover the secret to our electronic age”
9. **Think** – “how the creation of rudimentary **telephone switches** ushered in silicon chips for computers but also rewired our brains”

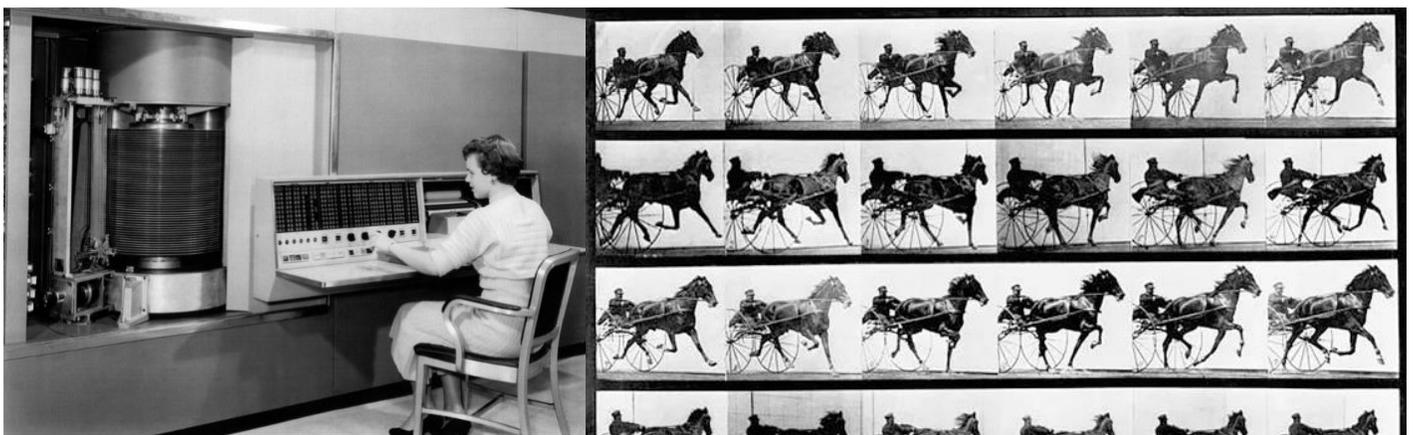
## Ainissa Ramirez TEDxBroadway “Where arts and science meet”

<https://caes.rutgers.edu/blog-post/alchemy-of-us-womens-history-month/>



## What were your thoughts on the book? What do you think about the follow and thought process of the author?

- Surprised that it did not have more women laced into the story especially with how the book was marketed
  - Talked about X-ray cathodes but missed a chance to talk about Marie Curie
  - Talked about data, binary and programming at length but mentioned Ada Lovelace in a single sentence rather than talking about her the way she did Edison and Einstein
- Not really my type of book – some members had trouble finishing it
- Loved the way she started talking about time
  - The influence on euro-centric definitions verses more relative traditions such as in Africa – how this played out in the music world with Jazz
- Loved the “Capture” chapter – felt like the most complete story
  - ⇒ Capturing a photo of motion
  - ⇒ Douglas Adams and using real/candid photos to capture real African Americans to lessen the impact of caricatures
  - ⇒ chemical technology developed but only designed with white people in mind > kodak color film failed to capture black tones and only fixed it when chocolate and furniture companies complained
  - ⇒ Polaroid chemists relized they were designing and selling to South Africa under Apartheid
  - ⇒ Polaroid had fixed lighting issues to capture black faces better to market better to South Africa since they were using them in the passports that helped them oppress their people
  - ⇒ today the coding there determines the pixel is still skewed to better address lighter tones (capturing white faces is still the technology/design’s priority > now coming into conversations with face recognition software)
- The railways, time, and glass seems to run throughout all the captures
- Loved how the arts were laced into a telling of technology’s history – beautiful comingling of social and physical sciences



## If this book had a sequel that focused on the energy industry, what technologies, inventors and artists would you want it to lace together?

- We'd like to see the stories of women manufacturing facility owners like the ones we meet on IAC assessments
- Influence of early rock concerts on sound engineering and energy design
- Nuclear, sun, wind and renewables – what seeds in early history were planted that got us here?
- EPA and environmental disasters and the women fighting on the front lines – talk about Rachel Carson's book
- Performance art – early 1900's and in the 60's
- Sustainable farming and agricultural worker's rights
- NASA and the women computers

## If NASA sent out another data dump to aliens today, what art/artists would be on it and what format would the data be in?

*"Edison tapped in an old love and tradition....In order for music to become easily accessible, it had to go through a metamorphosis in Edison's day. Music had to change its shape. It had to become physical. Music had to become data."*

## Do you think that the internet makes us more creative or less creative? More intelligent or less?

- Really a mixed bag – bit of both
  - "more raw material" (easy access to more knowledge)
  - "If creativity is defined as the blending of ideas, the breaking of ideas, and the bending of ideas, with that the internet can help one become more creative." ... the more knowledge you have the more creative you can be with it?
  - "Creativity can also have several steps to it of preparation, innovation and production. The web is a great tool for the first step... But there is a downside. Creativity is not just the warehousing of ideas but the process of giving the brain time to simmer on these ideas. Creativity requires preparation but it also needs incubation."
  - "There are a thousand ways to waste time on the internet"
- Dewey decimal system > control and google searching – hard to go back to analog systems on data consumption and reading
- Changes our capacity to remember because we can just google it later or does it change what we choose to remember? – knowing what to remember becomes a more valuable skill than information searching – more valuable skill to select which information to believe (reliability of sources)
- More space to process since we don't need to use as much space/time for memorizing



- In some ways brings us to Grad level approach to education faster – because if memorizing is less of a priority and get to comprehension and critical thinking sooner in education
- Forces us to think differently – not necessarily a bad thing
  - Maybe harder/bad for older generations but young generations that grew up thinking like this won't have a problem
- How does this effect the people who got ahead because they were exceptional but now technology bridges the gap for others? What can they do differently to continue to use their talents that technology is encroaching on? – Conversely makes room for more people that couldn't attain the knowledge/skill previously

## Two opposing statements:

*"The function of the physical sciences is to teach the social sciences how to fail without a sense of guilt"*

vs.

*"Scientists cannot separate their research from the application of their research and that the social sciences and the sciences in general work best in tandem like one hand washing the other"*

## Looking back at **"Parable of the Sower" from last book club:**

*Alchemy of Us* starts with a quote from *Parable of the Sower*, "All that you touch, touches. All that you change, changes you." The entire book is about the influence of advancing technology on human and societal development and their influence on technology in return. This idea extends to the art world as well.

**How does art and social interaction play into engineering?**

**How well did your engineering education balance your foundation in physical science, social science and the arts?**

**What are the biggest take-aways for the IAC Program and manufacturing today?**

**Are there any specific actions the WE<sup>2</sup> Network could take?**

- Use performance art in raising interest!
- Studies show that women engineering majors are more likely than their male peers to pursue dual majors or event interdisciplinary majors (a social science + engineering major OR an arts major + engineering major)
  - Members of this discussion included
  - through engineering, culture and individuals interact with physical science - engineering is where social and physical science overlap the most and it should be taught this way – and it being taught this way brings in more women to such programs



- Manufacturing processes often were designed in conjunction with the fine arts/artists (printmaking, glass blowing, metal casting, etc) – bring in artists into the discussion – demos, etc. – any schools in the program that have a strong art department with a foundry or glass study? If so could do a live streamed demo event (bring engineers into an artist foundry and talk about engineering/energy improvements)
- Put together some WE<sup>2</sup>/IAC socials that are focused on the arts – virtual jam band session (everyone brings an instrument to a zoom call), all women all stem rock/jazz band?, virtual museum tour, etc.
  - Group bonding is actually really important to Network building (and building trust for the deeper discussions) so socials with an art focus can be a useful tool for both recruitment and retention of women in the IAC

### ***Our Challenge to You:***

***Challenge:*** Identify your strongest 3 areas of knowledge/skill that are outside traditionally defined engineering and physical science disciplines.

*(i.e. music, theater, glass blowing, psychology, gender studies, etc.)*

1. *Set aside time in the next month to strengthen these skills, hobbies or knowledge.*
2. *Think about how these non-technical or non-physical science disciplines expand your ability as an engineer?*

Looking for more notes/videos on the book and author?

[https://en.wikipedia.org/wiki/Ainissa\\_Ramirez](https://en.wikipedia.org/wiki/Ainissa_Ramirez)

<https://www.youtube.com/watch?v=B7OUNQjZPBs>

<https://helenthehare.org.uk/2020/10/24/the-alchemy-of-us/>

