



Image of a significant portion of the Black American women with PhDs in physics, astronomy, materials science, and physics education, courtesy of African-American Women in Physics.

Black Women Physicists In the Wake

Science and slavery are inextricably entwined in our history



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*This paper was presented in a 2017 Society for the Social Studies of Science session entitled “Can the subaltern research?” Here is my answer. I encourage folks who can to choose the audio over the text to get a feel for the message and because I editorialize a little. I will try at some point to update the text to reflect the audio presentation, but below is almost identical to what I said. And I am happy for feedback from people who interpret for deaf/hard of hearing people about how to helpfully accentuate the text. Special thanks to Christina Sharpe for her important text *In the Wake*, which read to me as a science, technology, and society studies text, even if that wasn’t the author’s intention. Edit: At the bottom, I include a variation on how this ends which was presented at the 2017 Society for History of Technology meeting.*

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audio presentation from the 4S meeting (image: a photo of me with short hair in poor lighting holding a microphone)

Slavery is rarely the starting point for discussions about what many of us would call the post-enlightenment era development of science, which Jonathan Marks helpfully defines as “the production of convincing knowledge in modern society.” (We’ll save discussion the problematic use of “modern” here for the “Decolonizing STS” meetup at lunch.) Yet as Christina Sharpe teaches us in her many turns around “the wake,” science and slavery entwine repeatedly: whether it’s the early evolution of insurance and actuarial science to calculate the value of jettisoned cargo — brutally murdered people — or efforts to minimize the bow wave — the wake — of ships, to make them faster, to speed the movement of kidnapped Africans from the torturous Middle Passage to a tortured lifetime and usually death in the bondage of chattel slavery. In slavery begins what Katherine McKittrick calls “mathematics of Black life,” which extends to the writing of the American constitution, wherein a complex political and economic calculus renders us $\frac{3}{5}$ ths of a person because even on paper our wholeness is dangerous.

We never start with slavery, but my narrative as a queer Afro-Caribbean Black Ashkenazi Jewish femme particle physicist necessarily starts with it because my existence is shaped entirely in the wake of slavery, in the wake of trying to imagine what science means to the slave and her great great grandchildren.

How am I constructed and unconstructed? What is on my ontology? And what are the epistemologies I am allowed?

I am a Black woman in cosmology and particle physics with an interest in the early universe. I arrived at this place because the natural curiosity that I share with all my fellow apes extended to the physical world in childhood after I discovered fairly early on a particular pleasure in counting. Then I learned you could get paid to worry about the origins and evolution of the universe.

obsessively looking around nearly every professional space and noticing I am The Only One — the only woman, the only Black African origin person, definitely always the only Black woman. I say obsessively not to minimize the experience of those who are diagnosed with OCD but rather in connection: the summer after my freshman year of college, the first year I did this kind of counting, when I was still 17, I began picking at the skin around my fingers, and 17 years later, I travel with bandaids, always, because sometimes they bleed.

In a white supremacist society, a highly gifted Black woman child can count herself into dermatillomania, an impulse control disorder whereby my anger at the numbers not adding up gets turned inward on myself. 2000 PhDs are granted in physics in the US each year, Black women make up about 7% of the population, and maybe 5 of those PhDs goes to one of us. At the same time, I'm told that I'm still a postdoc and not a professor because I notice this and talk about it rather than shutting up and calculating. But, as a trained particle physicist — an expert in the uses and abuses of symmetry — am I not supposed to notice the physical contents — the people — of my professional space and that *I* am breaking its white, masculine symmetries?

What does it mean to speak of the pleasure of counting when what needs counting is the painful absence of other people like me? How do Black women rewrite themselves to mediate these two ways of knowing and relating to numbers? Is their research as physicists an act of self-consciously and reflexively asserting themselves, to borrow a turn of phrase from Hortense Spillers? If as Fred Moten posits, Black Atlantic lives are a matter of continuous improvisation, are we self-consciously constructing ourselves as physicists through performative improvisation? When we read texts like *Hidden Human Computers* by Duchess Harris and *Hidden Figures* by Margot Lee Shetterley, are we reading ourselves into existence through historiographic excavation? How does race figure into the science, technology, and society studies discourse about the contingency of ideas? Will the subaltern's research product, process, and priorities be identical to that of the dominant culture? By becoming a physicist, am I assimilating or asserting the hope and the dream of the slave who longed to find a way home?

In trying to answer these questions I identify tensions:

Between the idea of universality — that the laws of physics are the same everywhere in the universe and no matter who writes them down — and objectivity — that who is

embeddings teach us about how, as Adrienne Rich said, this is the oppressor's language, yet I need it to talk to you.

The tension of constructions of "who":

1. Blackness coming into being as a path to elevate those who are cast as white, thus Blackness as deathly imposition
2. Blackness as self-constructing, improvised identity formed in the wake, a Blackness beyond white control, or as Spillers put it, "outer-directed forces are not definitive, although they have been, in the case of diasporic African communities, unrelenting and overwhelming"

The tension of whether it's even okay to ask "who":

1. Does it ever matter?
2. When it is argued that it doesn't, who does it serve?
3. When the mattering only serves the discipline as it is, and not the people at the margins of the discipline, what are the implications for the relationship between the people and the discipline? Whom does the discipline serve? Was the Manhattan Project serving Japanese people?

Tensions between power and imagination:

1. Claims that science is all about imagination belie the power dynamics associated with who is typically given the opportunity to explore, and the way science has distinguished itself at times from the arts as a militaristic tool
2. Yet, could it come to be about imagination and improvisation?
3. How is improvisation both in the wake of racism and a beautiful high jump over the barrier of racism?

Tensions between present and past:

1. In the wake, science is a tool of oppression, the way the boat is better designed, the way pure astronomy is funded to help make distance measurements between the

2. But also in the wake, science is stolen intellectual property. Enslaved Africans were midwives, herbalists, nurses, engineers, agriculturalists, chemists, mathematicians, and amateur astronomers, following the drinking gourd — what Europeans called the Big Dipper — to freedom.
3. So also in the wake, curiosity cannot be controlled by whiteness
4. Now in 2017 Black girls self-construct and improvise their way to engineering degrees after which they may build boats or like Renee Horton, President of the National Society of Black Physicists, help build space faring machines

In 2005, Sylvester James Gates, a prominent Black American theoretical physicist, gave an interview in which he told a story about Nobel Laureate in Physics, Abdus Salam:

In the early eighties Professor Salam commented he suspected that when a sufficient number of people of the African Diaspora start to do physics, something like jazz would appear. It took 15 or 20 years before I had the intimate knowledge of physics necessary to interpret this statement well enough to understand his meaning . . . When enough people of African heritage do physics, they're going to bring a different aesthetic, and it will be new and valuable. Because classical music and jazz exist we don't think that we're musically poorer. Had jazz never come into existence we would've been musically poorer, but before jazz, musicians could say, "We're doing just fine. We have this wonderful art form here."

Whereas I hear one thing when Jim talks, others hear something different. This quote is sometimes repeated in the discourse of diversity, whereby underrepresented minority — Black American, Native American, Latinx, and Pacific Islander — scientists are constructed as a valued commodity in science because of the intellectual products we might contribute. In the wake of slavery, what does it mean to reduce the Black need for Black equality to a matter of a majority white society needing Black ideas? Has anything changed?

One reading is that Gates and Salam are essentializing Black people.

This reading intimates a failure to understand the roots of Jazz, which rather than being a deficient attempt at European-only thought modes, is a distinctly Black American thought mode which takes the same musical instruments and constructs something *different, not deficient* with it. As Amiri Baraka explains in *Blues People*,

decidedly did not belong to the oppressor.

This was in fact what initially attracted me to particle physics, for what could be further from the terrible things which inspired the Los Angeles Uprising that we had just lived through than the details of what we are made of, than the pleasure of counting, a universally interesting activity?

Little did I know that the oppressor had the tightest grip on this work especially. In 2017 I am the only Black woman with a PhD working in theoretical cosmology in North America, and one of only two in theoretical particle physics, the field considered the most abstract and thus in white supremacist patriarchal tradition, the most elite in physics.

And now I don't just count but I begin to ask questions I was trained not to ask: why am I here in this room and what is it that I have to offer that none of these (mostly white) men around me can offer? To ask this question is itself an act of improvisation — an act of turning off self-censorship in the moment — i.e. I have been trained not to ask, yet I do. I have been trained to believe that physics is objective, and it gets no more objective than when it gets mathematical, when it gets theoretical. And that means that if there are no other Black women in the room, it's because Black women are broken. Even when I know that's wrong, 17 years of professional training says that it's right. And that is the barrier I improvise my way over, every time. And now I wonder, because I am a scientist, trained to ask questions, what other ways do improvisation serve me as a scientist?

Evelyn Fox Keller talks about western epistemic constructions of science as “male” and nature as “female,” leading to what Banu Subramaniam and Mary Wyer have called dementoring — the training of women in STEM by “untraining them as women” and assimilating them as scientists. Black women, famously in the double bind, face untraining as women along with efforts to “patch up” the 2/5s deficit in our humanity. Here, the wake is telegraphed by society: by virtue of birth we are unconstructed as potential scientists.

Yet Black improvisation of a human identity, of a peoplehood, what we might call jazz as a shorthand, is telegraphed by family-community. Improvising ourselves into existence becomes a way of life, a way of playing the world, a way of making meaning

ethnic society's definition of who can be an observer.

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To analyze the lives of Black women scientists and technologists without accounting for the unique challenges of personhood and peoplehood construction that Black Americans and Black women especially have faced is indeed a failure to tell part of the story.

Thus, I find myself interested in experiments in biography, especially Jan Golinski's recent biography of chemist Humphry Davy, which looks at Davy through the lens of personae he himself constructed and presented to varying degrees both publicly and privately.

Simultaneously, I believe that ethnography is a critical facet of the investigation of how individual scientists and technologists are made into legitimized observers.

As musician and academic Vijay Iyer has said, "You have to teach someone not to improvise." Looked at through a prism, my questions are about how to describe individual members of a people who were repeatedly taught not to improvise themselves into humanity, but did it anyway, with varying degrees of engagement with how the establishment conceives of personhood, but also through innovation in the wake.