

Book Review | *The Disordered Cosmos: A Journey into Dark Matter, Spacetime, and Dreams Deferred*, by Chanda Prescod-Weinstein (Bold Type Books, 2021)

Alexis Shotwell

Carleton University
alexis.shotwell@carleton.ca

You have almost certainly heard of, and perhaps already read, Chanda Prescod-Weinstein's important new book *The Disordered Cosmos: A Journey into Dark Matter, Spacetime, and Dreams Deferred*. It has quickly achieved more popular uptake than many of us who care about feminist STS would have dreamed possible. The reviews everywhere from CNN to Goodreads show that non-academic, ordinary people, many of whom profess themselves terrified by science, read and love this book. Notably, what they say about it indicates that Prescod-Weinstein has achieved one of the remarkably difficult tasks she set herself in the book: a popular science book that helps people who love justice to also love science, and people who love science to also love justice. The book is masterfully and carefully crafted—it is brilliant, evocative, funny, brave, searching, and careful—so it also works as just a book you could give someone who likes reading good writing (and/or Star Trek).

Catalyst readers, too, will find much here. Prescod-Weinstein's 2020 *Signs* article "Making Black Women Scientists under White Empiricism: The Racialization of Epistemology in Physics" articulates a conception of "white empiricism": "the phenomenon through which only white people (particularly white men) are read as having a fundamental capacity for objectivity and Black people (particularly Black women) are produced as an ontological other" (421). The epistemic salience of this coproduction of whiteness and (non)objectivity, alongside the production of who knows and who can be known rests, as so many things do, on the material conditions that produce racialization, prestige asymmetries in science practice,

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and epistemic injustice. But as Prescod-Weinstein shows, white empiricism isn't primarily a matter of epistemic injustice; instead, "it describes a resistance not just to testimony but also to empirical fact" (425). Read in relation to her work on white empiricism, *The Disordered Cosmos* diffracts what Prescod-Weinstein names as a "kind of loneliness produced by being a politically radical Black woman in physics" (2021, 256) into an abiding joy and love for the queerness of the universe that opposes practices of white empiricism. In this joy, we find the possibility for a science better in every way.

As Prescod-Weinstein shows, joy in and love for science is collectively conceived and sustained, and current loneliness is a call for things to be otherwise. I left this book with a lively sense of the possibilities for collectivity, between humans but also among us and the ecologies that support and sustain us and the night sky. The closing section of the book elaborates the idea that we could meaningfully practice responsibility for "All Our Galactic Relations," grounded in part through our political practices of good relations on this, our planetary home. As a touchstone, Prescod-Weinstein offers the story of her mom taking her out of LA to see the Comet Hyakutake pass through a sky dark enough to perceive it. She writes, "My Black feminist thought about this story is: what are the conditions we need so that a thirteen-year-old Black kid and their single mom can go look at a dark night sky, away from artificial lights, and know what they are seeing?" (260). Those intertwined material and epistemic conditions—having the collective material resources to go and knowing what you are seeing once you get there—require, as Prescod-Weinstein elucidates, radical politics in the sense of going to the root of how the world is made under current power relations, and changing them.

The book begins with the most to-the-rootness we can name, the literal beginning of the universe. Just like the universe, it rapidly expands from there, with Prescod-Weinstein as guide, griot, and inheritor of generations of scientists who have turned to the sky for freedom. It continues in four "phases:" *Just Physics*, *Physics and the Chosen Few*, *The Trouble with Physicists*, and *All Our Galactic Relations*.

In Phase 1 ("In which the universe is, for a time, human-free" [9]), we learn about elementary particles, known forces, and various cool things that we know we don't understand. Even readers who are number phobic will leave this section convinced that particle physics can teach us that "the universe is always more bizarre, more wonderfully queer than we think" (13). This insight will call to mind Karen Barad's elaboration of the queerness of our universe; I realized that one thing that makes me trust the science of *The Disordered Cosmos*—though I am incapable of assessing it—was the exemplary citational and explanatory engagement with canonical STS texts such as *Meeting the Universe Halfway*, which manages to offer clear explanations that do justice to theoretically dense

material. As a truly interdisciplinary text, working at the highest levels in both STS and theoretical physics, this book accomplishes enormously difficult things as though they were easy.

Alongside the wonder that animates each explanation of loving quarks (and other particles) Prescod-Weinstein shows how racism has shaped and torqued the “patterns and backstories” of science, as well as things as foundational as naming practices. From equating Black people (actual people, who can definitely be perceived in a number of different ways including visually) with dark matter (actually transparent, invisible to light) to quantum chromodynamics (which use “colors” to constitute whiteness), Prescod-Weinstein shows that the language of science matters: “Color’ and ‘white as neutral’ are here not as reflections of how the universe works, but rather how homogenous, white scientific community comes up with new names for stuff” (22).

Phase 2 attends more fully to the human part of our universe, and to how racist science has constricted and distorted who can do science and what science can be done. With riveting discussion of the physics of melanin, deepened reflections on the causes and effects of racist language in physics practice, and a thorough grappling with the question of who counts as a scientist as we tell the history of a time period we are still living within, this section of the book constellates reality and politics. If you teach this book, students will leave these sections convinced that theoretical physics is really, really amazing and neat, and wondering how much more amazing it would be were it not so densely enmeshed with racism and colonialism.

The second half of the book deepens the inquiry into why it matters that physics is a human practice. The chapters here feel a bit like when the optometrist clicks different lenses down to find what configuration will produce in-focus vision—except that Prescod-Weinstein offers lenses that illuminate the world you didn’t understand was there, in sequence but showing how things are connected. And the lenses change your mind and inspire a sense of wanting to change the world instead of only offering corrective distortion. Including chapters on re-evaluating history in order to dream other futures, the need for a world in which trans and agender people, including scientists, flourish, and what it means for rape to be part scientific story, this section is wrenchingly important. The chapter “Wages for Scientific Housework” will quickly become required reading in any feminist STS class.

The Disordered Cosmos demonstrates the haunting illogic, tragedy, and just plain *wrongness* of white empiricism, of practicing science through racism. I encountered the concept of “axiom lock” through writer Graydon Saunders; it names that pattern in which the starting point of our reasoning, the things we assume as baselines, are incommensurate with our interlocutor’s. Prescod-

Weinstein shows a critical axiom lock functioning systemically within science, between axioms necessary to accurately perceiving the world and racist axioms. As she says, “It’s hard to escape the logic of slavery in a society that was built on it” (108). She writes of the difference between the scientific reality of melanin and its social reality as part of race as a configuration of social relations of power and oppression, for example. In this case, “Racism was axiomatic, rather than a belief requiring skeptical investigation” (101). But axiom lock can be broken, as when a visiting physicist, Dr. Vera Rubin, asked Prescod-Weinstein her opinion about the problem of dark matter. Prescod-Weinstein says, “Dr. Rubin challenged how I was treated in physics by treating me as if I was a person who could solve a major problem in physics” (43)—people must be seen as human to be seen as scientists; axiom locks have politics built in, but they can be transformed. Prescod-Weinstein writes, “We can resist. We can choose a different timeline. And we should” (272).

This book enacts a refusal of white empiricism and imagines that science can be otherwise. It demonstrates the possibility that, if we turn to move alongside Prescod-Weinstein towards that otherwise, both science and the world would be better. For we who work in feminist STS, turning toward love for the world and love for science will feel familiar, and complicated. *The Disordered Cosmos* offers, with tremendous generosity, a portal towards that just, joyful, science practice. I’m excited to see what happens when more of us reorient in that direction.

References

Prescod-Weinstein, Chanda. 2020. “Making Black Women Scientists under White Empiricism: The Racialization of Epistemology in Physics.” *Signs* 45 (2). <https://doi.org/10.1086/704991>.

Author Bio

Alexis Shotwell’s work focuses on complexity, complicity, and collective transformation. A Professor at Carleton University, on unceded Algonquin land, she is the co-investigator for the AIDS Activist History Project (aidsactivisthistory.ca), and the author of *Knowing Otherwise: Race, Gender, and Implicit Understanding* and *Against Purity: Living Ethically in Compromised Times*.