The MIT Press
London Book Fair
2021 - Spring 21 titles

Viruses, Pandemics, and Immunity

Arup K. Chakraborty and Andrey S. Shaw

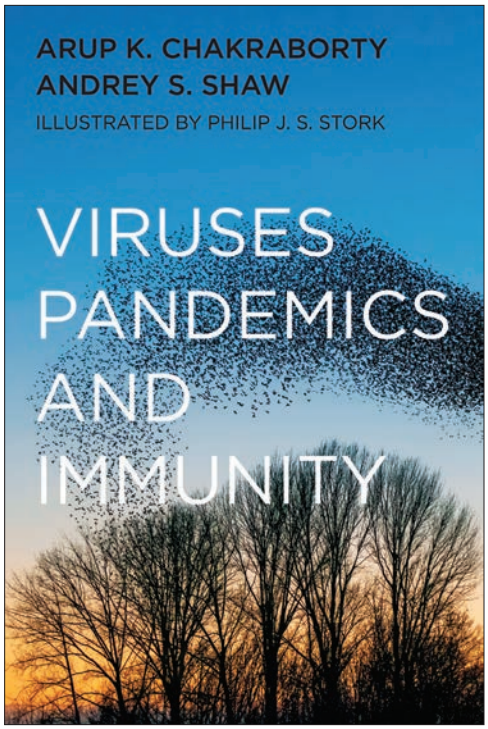
illustrated by Philip J. S. Stork

Throughout history, humans have contended with pandemics. History is replete with references to plagues, pestilence, and contagion, but the devastation wrought by pandemics had been largely forgotten by the twenty-first century. Now, the enormous human and economic toll of the rapidly spreading COVID-19 disease offers a vivid reminder that infectious disease pandemics are one of the greatest existential threats to humanity. This book provides an accessible explanation of how viruses emerge to cause pandemics, how our immune system combats them, and how diagnostic tests, vaccines, and antiviral therapies work—concepts that provide the foundation for our public health policies.

The authors, both experts in immunology, interweave explanations of scientific principles and ongoing efforts to combat COVID-19 with stories of the people behind the science. They recount the eradication of smallpox—the greatest accomplishment of vaccines and public health; discuss microbial pathogens; and describe what we know about modern pandemics, including how they spread, how they can be contained, and how they can be treated. They do not offer prescriptions for what to do, but equip readers to be informed participants in debates about how to create a more pandemic-resilient world. We do not have to repeat the mistakes made with COVID-19.

Arup K. Chakraborty is Robert T. Haslam Professor of Chemical Engineering and Professor of Physics and Chemistry at MIT, where he also served as the Founding Director of the Institute for Medical Engineering and Science. He is a founding member of the Ragon Institute. **Andrey S. Shaw**, an immunologist, is Staff Scientist in Immunology and Oncology at Genentech and holds adjunct professorships at Washington University in St. Louis and at the University of California, San Francisco. Illustrator **Philip J. S. Stork**, a cellular and molecular biologist, is Senior Scientist at the Vollum Institute, Oregon Health and Science University, Portland, Oregon.

"This remarkable book will take the reader on a fascinating journey—how scientists have developed a deep understanding of our immune system, how this system fights viruses, and how vaccines and antiviral therapies work. This human story addresses the many questions that people worldwide are grappling with during the current global pandemic."
—Arun Majumdar, Stanford University and Founding Director of ARPA-E

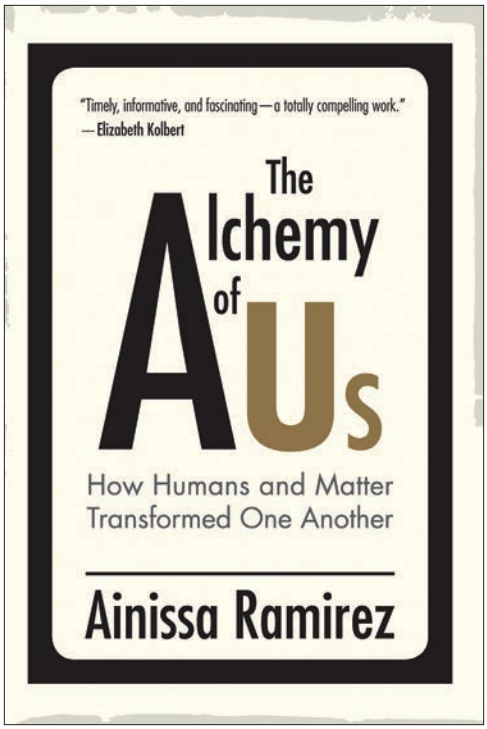


How viruses emerge to cause pandemics, how our immune system combats them, and how diagnostic tests, vaccines, and antiviral therapies work.

February
5 3/8 x 8, 208 pp.
38 illus.

US $19.95T/$25.95 CAN paper
978-0-262-54238-8

science



In the bestselling tradition of *Stuff Matters*: An engaging look at materials, the innovations they made possible, and how these technologies changed us.

April
6 x 9, 328 pp.
102 illus,

US $17.95T/$23.95 CAN paper
978-0-262-54226-5

cloth
978-0-262-04380-9

The Alchemy of Us

How Humans and Matter Transformed One Another

Ainissa Ramirez

In *The Alchemy of Us*, scientist and science writer Ainissa Ramirez examines eight inventions—clocks, steel rails, copper communication cables, photographic film, light bulbs, hard disks, scientific labware, and silicon chips—to reveal how they shaped the human experience. Ramirez tells the fascinating and inspiring stories of the woman who sold time, the inventor who inspired Edison, and the hotheaded undertaker whose invention pointed the way to the computer. She describes how our pursuit of precision in timepieces changed how we sleep; how the necessary brevity of the telegram influenced Hemingway's writing style; and how a young chemist exposed the use of Polaroid's cameras to create passbooks to track Black citizens in apartheid South Africa.

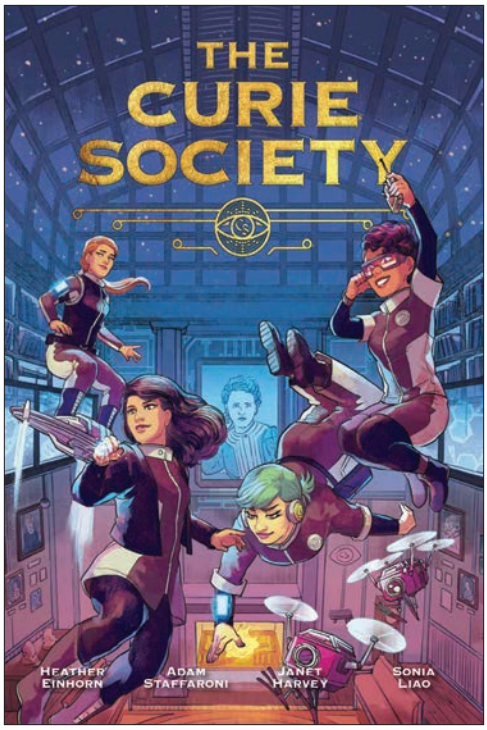
Ainissa Ramirez
Photo by Bruce Fizzell.

Filling in the gaps left by other books about technology, Ramirez showcases little-known inventors—particularly people of color and women—who had a significant impact but whose accomplishments have been hidden by mythmaking, bias, and convention. Doing so, she shows us the power of telling inclusive stories about technology.

Ainissa Ramirez is a materials scientist and sought-after public speaker and science communicator. A Brown and Stanford graduate, she has worked as a research scientist at Bell Labs and held academic positions at Yale University and MIT. She has written for *Time*, *Scientific American*, the *American Scientist*, and *Forbes*, and makes regular appearances on PBS's *SciTech Now*.

"We live in a world so dominated by our own inventions that, as Ainissa Ramirez observes, we've reinvented ourselves to accommodate them. *The Alchemy of Us* is at once timely, informative, and fascinating—a totally compelling work."
—Elizabeth Kolbert, Pulitzer Prize–winning author of *The Sixth Extinction*

"Ramirez's ingenious survey illuminates the effect of science in a manner accessible to a wide readership." ***—Publishers Weekly***



The Curie Society

created by Heather Einhorn and Adam Staffaroni

writer: Janet Harvey

artist: Sonia Liao

editor: Joan Hilty

An action-adventure original graphic novel, *The Curie Society* follows a team of young women recruited by an elite secret society—originally founded by Marie Curie—with the mission of supporting the most brilliant female scientists in the world. The heroines of the Curie Society use their smarts, gumption, and cutting-edge technology to protect the world from rogue scientists with nefarious plans. Readers can follow recruits Simone, Taj, and Maya as they decipher secret codes, clone extinct animals, develop autonomous robots, and go on high-stakes missions.

The Curie Society introduces an entertaining, empowering media universe for fans hungry to read about brilliant, analytical young women as scientific heroes. Stay tuned for more Curie Society missions featuring our heroes saving the world through their STEM skills and teamwork.

A covert team of young women—members of the Curie society, an elite organization dedicated to women in STEM—undertakes high-stakes missions to save the world.

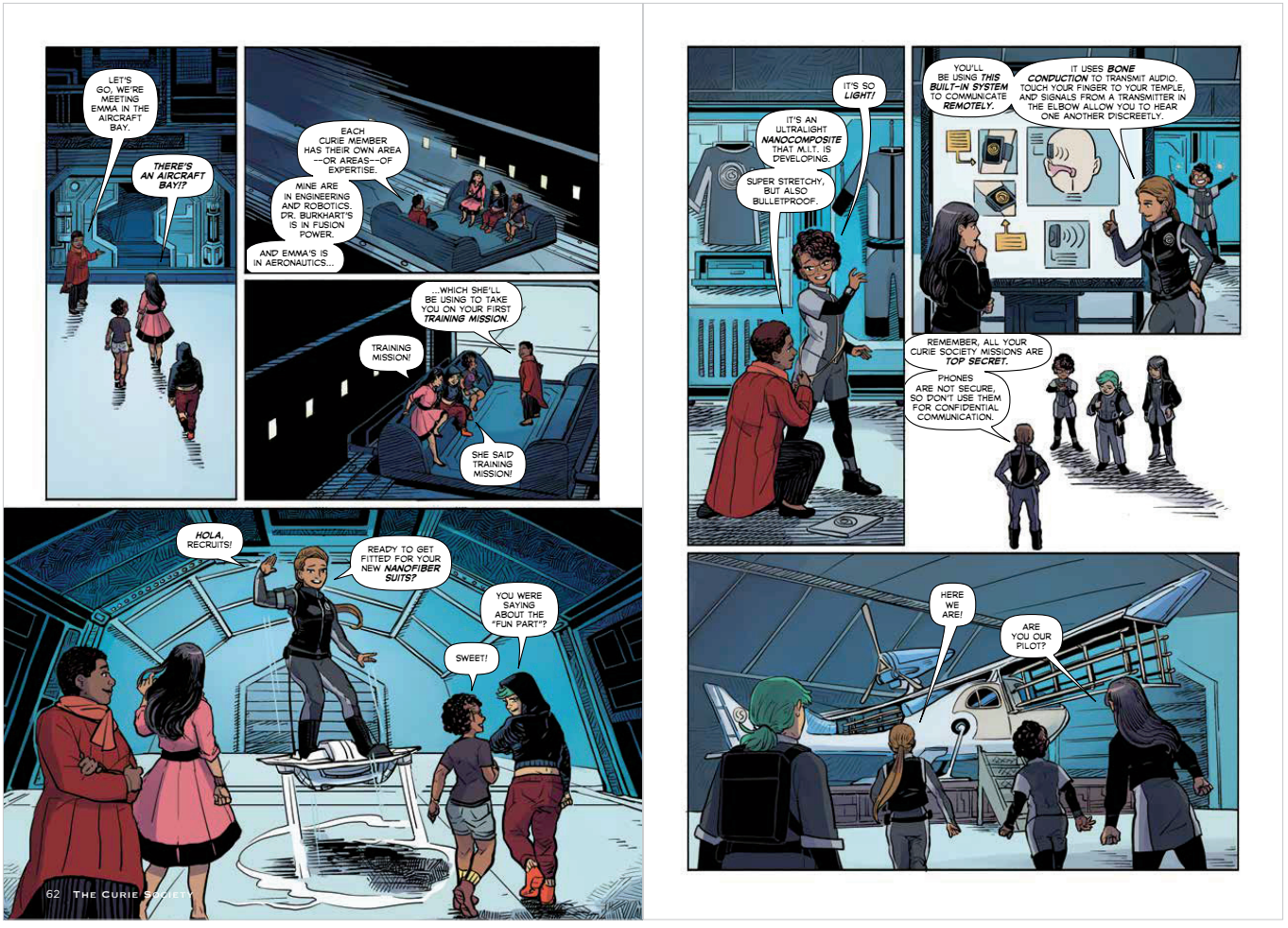
April
6 1/2 x 9 5/16, 168 pp.
200 color illus.

US $18.95T/$24.95 CAN paper
978-0-262-53994-4

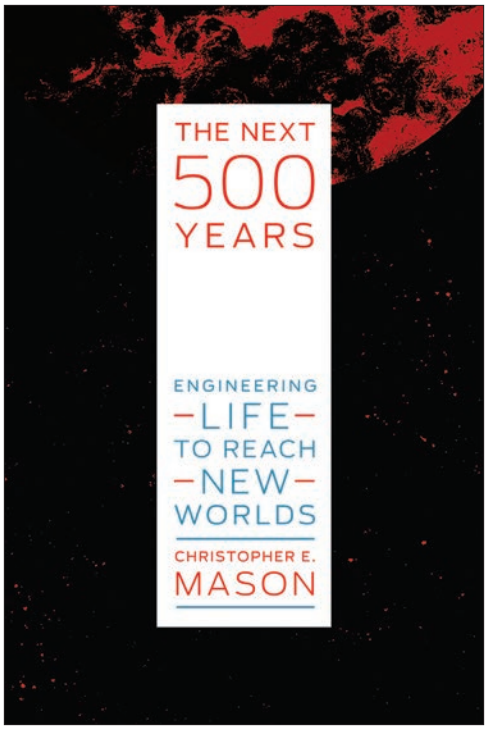
Creators **Heather Einhorn** and **Adam Staffaroni** also created the hit teen scripted podcast *Lethal Lit: A Tig Torres Mystery* (a *New York Times* Great Podcast of 2018). Comic book writer **Janet Harvey**'s credits include the graphic novel *Angel City: Town without Pity*. Illustrator **Sonia Liao**'s past credits include the Ember in the Ashes graphic novel *A Thief Among the Trees*.

"A fun comic starring heroines who find themselves solving one scientific puzzle after the next!"
—Andy Weir, author of *The Martian* and *Artemis*

From *The Curie Society*



62 THE CURIE SOCIETY



The Next 500 Years

Engineering Life to Reach New Worlds

Christopher E. Mason

Inevitably, life on Earth will come to an end, whether by climate disaster, or by cataclysmic war, or the death of the sun in a few billion years. To avoid extinction, will we have to find a new home planet, perhaps even a new solar system, to inhabit? In this provocative and fascinating book, Christopher Mason argues that we have a moral duty to do just that. Because we are the only species aware that life on Earth has an expiration date, we have a responsibility to act as the shepherd of lifeforms—not only for our species but for all species on which we depend and for those still to come (by accidental or designed evolution). Mason argues that the same capacity for ingenuity that has enabled us to build rockets and land on other planets can be applied to redesigning biology so that we can sustainably inhabit those planets. And he lays out a 500-year plan for undertaking the massively ambitious project of reengineering human genetics for life on other worlds.

As they are today, our frail human bodies could never survive exposed on another planet. Mason describes the toll that long-term space travel took on astronaut Scott Kelly, who returned from a year on the International Space Station with changes to his blood, his bones, and his genes. Mason proposes a ten-phase program that would engineer the genome so that humans could tolerate the extreme environments of outer space—with the ultimate goal of achieving human settlement of new solar systems. He lays out a roadmap of which solar systems to visit first, and merges biotechnology, philosophy, and genetics to offer an unparalleled vision of the universe to come.

An argument that we have a moral duty to explore other planets and solar systems—because human life on Earth has an expiration date.

April
6 x 9, 304 pp.
16 color illus., 24 b&w illus.

US $29.95T/$39.95 CAN cloth
978-0-262-04440-0

Christopher E. Mason is a geneticist and computational biologist who has been a Principal Investigator and Co-investigator of seven NASA missions and projects. He is Associate Professor at Weill Cornell Medicine, with affiliate appointments at the Meyer Cancer Center, Memorial Sloan Kettering Cancer Center, and the Consortium for Space Genetics at Harvard Medical School.

CRISPR People

The Science and Ethics of Editing Humans

Henry T. Greely

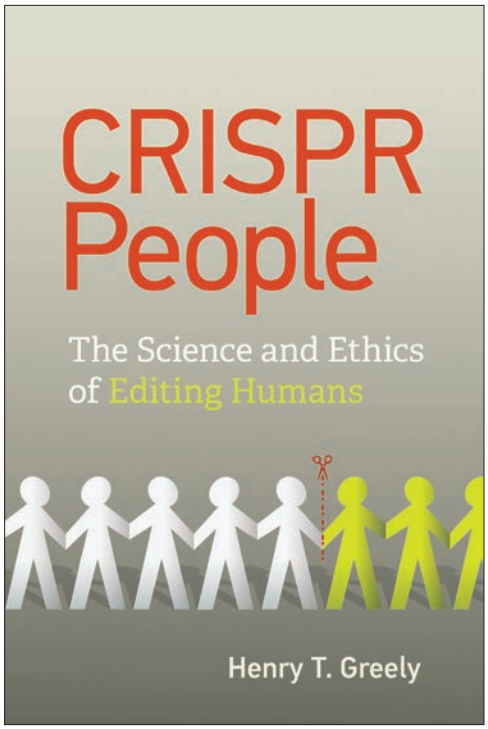
In November 2018, the world was shocked to learn that two babies had been born in China with DNA edited while they were embryos—as dramatic a development in genetics as the 1996 cloning of Dolly the sheep. In this book, Hank Greely, a leading authority on law and genetics, tells the fascinating story of this human experiment and its consequences. Greely explains what Chinese scientist He Jiankui did, how he did it, and how the public and other scientists learned about and reacted to this unprecedented genetic intervention.

The two babies, nonidentical twin girls, were the first "CRISPR'd" people ever born (CRISPR, Clustered Regularly Interspaced Short Palindromic Repeats, is a powerful gene-editing method). Greely not only describes He's experiment and its public rollout (aided by a public relations adviser) but also considers, in a balanced and thoughtful way, the lessons to be drawn both from these CRISPR'd babies and, more broadly, from this kind of human DNA editing—"germline editing" that can be passed on from one generation to the next.

Greely doesn't mince words, describing He's experiment as grossly reckless, irresponsible, immoral, and illegal. Although he sees no inherent or unmanageable barriers to human germline editing, he also sees very few good uses for it—other, less risky, technologies can achieve the same benefits. We should consider the implications carefully before we proceed.

Henry T. Greely is Professor of Law, Professor by Courtesy of Genetics, and Director of the Stanford Center for Law and the Biosciences at Stanford University, where he also chairs the Steering Committee of the Stanford University Center for Biomedical Ethics and directs the Stanford Program in Neuroscience and Society.

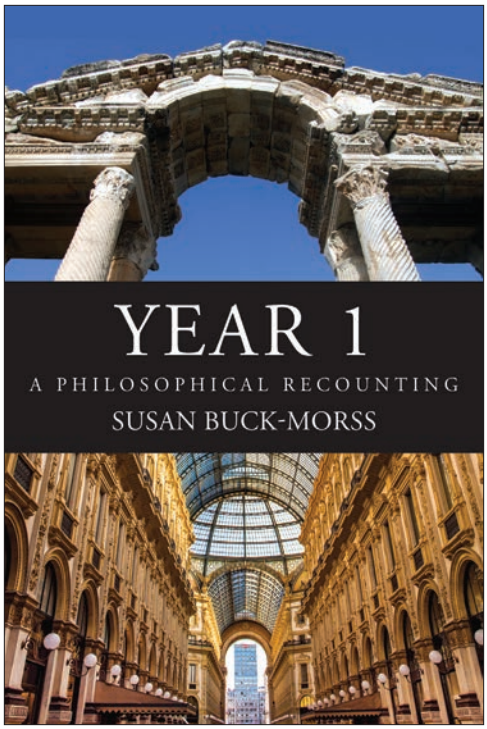
Henry T. Greely
Photo by Steve Gladfelter.



What does the birth of babies whose embryos have gone through genome editing mean—for science and for all of us?

February
5 3/8 x 8, 400 pp.

US $27.95T/$36.95 CAN cloth
978-0-262-04443-1



YEAR 1

A Philosophical Recounting

Susan Buck-Morss

Conventional readings of antiquity cast Athens against Jerusalem, with Athens standing in for "reason" and Jerusalem for "faith." And yet, Susan Buck-Morss reminds us, recent scholarship has overturned this separation. Naming the first century—"year one"—as a zero point that divides time into before and after is merely a retroactive numbering plan, nothing more than a convenience that is empirically meaningless. In *YEAR 1*, Buck-Morss liberates the past so it can speak to us in another way, reclaiming the first century as common ground rather than the origin of deeply entrenched differences.

Buck-Morss aims to topple various conceptual givens that have shaped modernity as an episteme and led us into some unhelpful post-modern impasses. She approaches the first century through the writings of three thinkers often marginalized: Flavius Josephus, historian of the Judean war; the neo-Platonic philosopher Philo of Alexandria; and John of Patmos, author of Revelation, the last chapter in the Christian Bible. Also making appearances are Antigone and John Coltrane, Plato and Bulwer-Lytton, al-Farabi and Jean Anouilh, Nicholas of Cusa and Zora Neale Hurston—not to mention Descartes, Kant, Hegel, Kristeva, and Derrida.

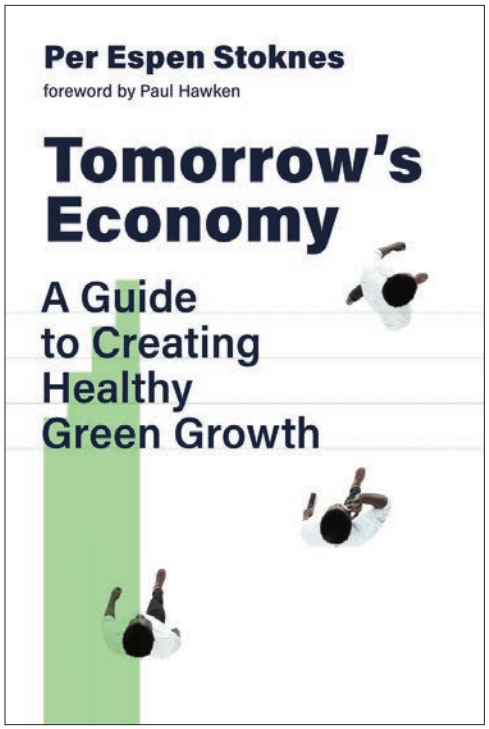
Buck-Morss shows that we need no longer partition history as if it were a homeless child in need of the protective wisdom of Solomon. Those inhabiting the first century belong together in time and therefore not to us.

Reclaiming the first century as common ground rather than the origin of deeply entrenched differences: liberating the past to speak to us in another way.

April
6 x 9, 416 pp.
71 illus.

US $27.95T/$36.95 CAN cloth
978-0-262-04487-5

Susan Buck-Morss is Distinguished Professor of Political Theory at the CUNY Graduate Center and Jan Rock Zubrow Professor Emerita of Government at Cornell University. She is the author of *Dreamworld and Catastrophe: The Passing of Mass Utopia in East and West* (MIT Press) and other books.



A balance sheet for the planet: How we can achieve healthy growth—more regenerative than wasteful, instilling equity rather than exacerbating inequalities.

March
6 x 9, 384 pp.
32 illus.

US $27.95T/$36.95 CAN cloth
978-0-262-04485-1

Tomorrow's Economy

A Guide to Creating Healthy Green Growth

Per Espen Stoknes

foreword by Paul Hawken

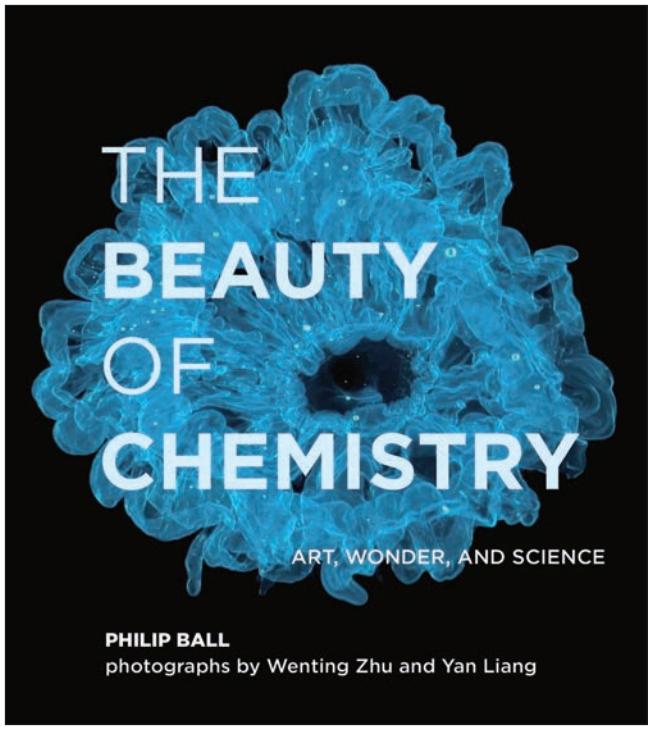
In *Tomorrow's Economy*, Per Espen Stoknes reframes the hot-button issue of economic growth. Going beyond the usual pro-growth versus anti-growth debate, Stoknes calls for healthy growth. Healthy economic growth is more regenerative than wasteful, repairs problems rather than greenwashing them, and restores equity rather than exacerbating inequalities. Stoknes—a psychologist, economist, climate strategy researcher, and green-tech entrepreneur—shows that we already have the tools to achieve healthy growth, but our success depends on transformations in scaling innovations, government practices, and individual behaviors. Stoknes provides a compass to guide us toward the mindset, mechanisms, and possibilities of healthy growth.

Stoknes explains that healthy growth reimagines value creation as resource smart and inclusive. Healthy growth is measurably profitable, more resource-productive, and more redistributive by design each year. Stoknes distinguishes between healthy and unhealthy kinds of economic growth at personal, corporate, city, national, and global levels, mapping a three-part synergy that benefits buyers, sellers, and society. He outlines actions we can take now—including the creation of a new legal entity, the benefit corporation—and lays out six steps companies can take toward healthy growth. He also describes how we can vote with our wallets to prioritize sustainability. The engaged citizen, he tells us, is central to the shift toward healing growth.

Per Espen Stoknes is Director of the Center for Sustainability and Energy at the Norwegian Business School in Oslo. His award-winning book *What We Think About When We Try Not to Think About Global Warming* became the focus of a TED Talk with more than three million views.

Per Espen Stoknes

"Too often growth supporters and anti-growthers come to loggerheads, neglecting the crucial issue of what kind of economic growth we're creating. Stoknes's growth compass is a crucial tool to guide us toward a finer future."
—Hunter Lovins, coauthor of *Natural Capitalism*



The Beauty of Chemistry

Art, Wonder, and Science

Philip Ball

photographs by Wenting Zhu and Yan Liang

Chemistry is not just about microscopic atoms doing inscrutable things; it is the process that makes flowers and galaxies. We rely on it for bread-baking, vegetable-growing, and producing the materials of daily life. In stunning images and illuminating text, this book captures chemistry as it unfolds. Using such techniques as microphotography, time-lapse photography, and infrared thermal imaging, *The Beauty of Chemistry* shows us how chemistry underpins the formation of snowflakes, the science of champagne, the colors of flowers, and other wonders of nature and technology. We see the marvelous configurations of chemical gardens; the amazing transformations of evaporation, distillation, and precipitation; heat made visible; and more.

The visuals in *The Beauty of Chemistry* are drawn from the online exhibition Envisioning Chemistry created by Wenting Zhu and Yan Liang in collaboration with the Chinese Chemical Society. These striking images are accompanied by accessible, engaging explanations by award-winning science writer Philip Ball.

Images and text capture the astonishing beauty of the chemical processes that create snowflakes, bubbles, flames, and other wonders of nature.

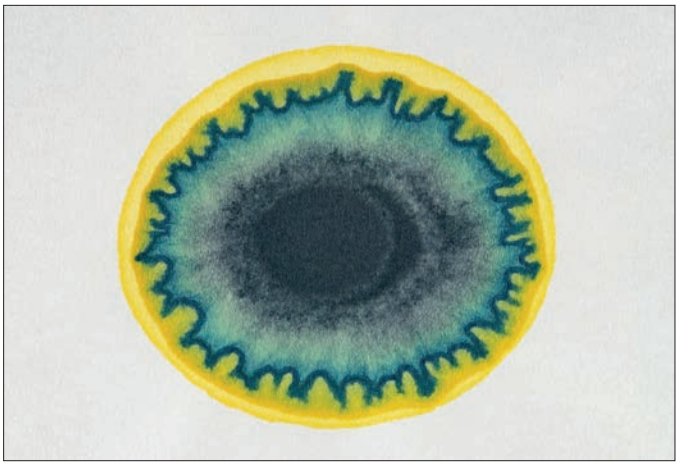
May
8 x 9, 400 pp.
354 color illus.

US $49.95T/$65.95 CAN cloth
978-0-262-04441-7

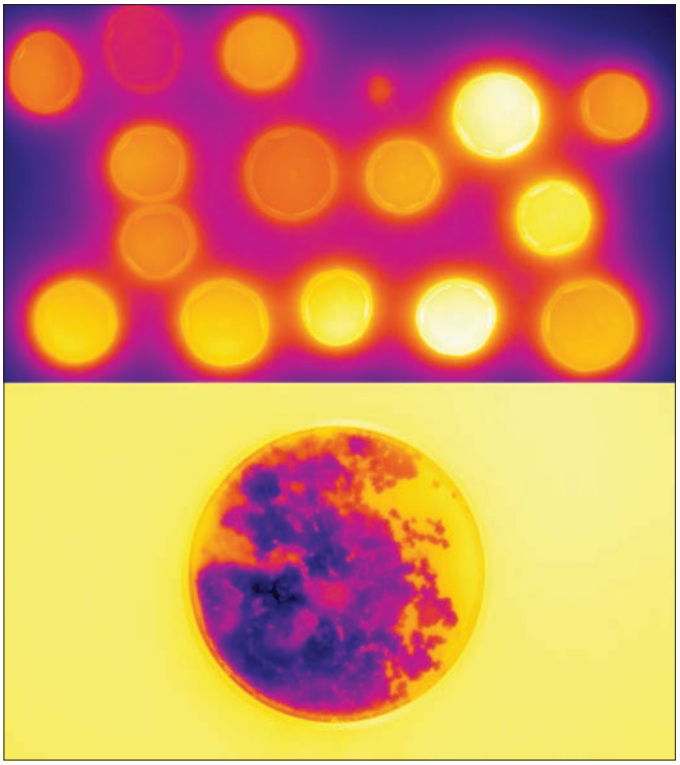
Philip Ball is the author of many critically acclaimed books of popular science, including *Critical Mass: How One Thing Leads to Another*, *The Elements: A Very Short Introduction*, and *Beyond Weird: Why Everything You Thought You Knew about Quantum Physics Is Different*. **Wenting Zhu** is an artist, designer, and photographer. **Yan Liang** is Associate Professor at the University of Science and Technology of China and the founder and producer of the educational brand Beauty of Science. He has worked as a science animator and illustrator.

"Philip Ball is a serendipitous writer, pursuing adventurous science. He loves to persuade and enchant his readers to celebrate the uncanny beauty of chemistry."
—Dudley Herschbach, Nobel Laureate in Chemistry, Harvard University

"As a child, I was drawn to chemistry by the wonders of precipitating powders, fizzy water, and other ever-present phenomena. *The Beauty of Chemistry* took me back to those times."
—Alán Aspuru-Guzik, Professor of Chemistry and Computer Science, University of Toronto

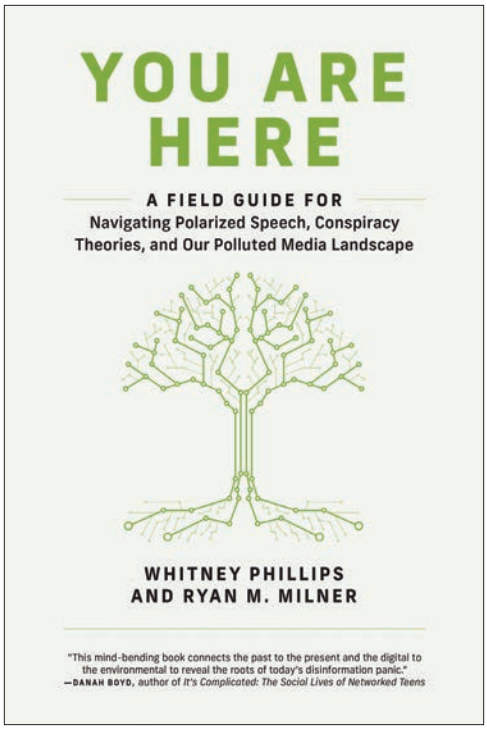


Photograph by Wenting Zhu and Yan Liang, from *The Beauty of Chemistry*, "10 Patterns."



Photograph by Wenting Zhu and Yan Liang, from *The Beauty of Chemistry*, "Seeing the Heat."

Photograph by Wenting Zhu and Yan Liang, from *The Beauty of Chemistry*, "10 Patterns."



How to understand a media environment in crisis, and how to make things better by approaching information ecologically.

March
6 x 9, 280 pp.

US $22.95T/$29.95 CAN paper
978-0-262-53991-3

You Are Here

A Field Guide for Navigating Polarized Speech, Conspiracy Theories, and Our Polluted Media Landscape

Whitney Phillips and Ryan M. Milner

Our media environment is in crisis. Polarization is rampant. Polluted information floods social media. Even our best efforts to help clean up can backfire, sending toxins roaring across the landscape. In *You Are Here*, Whitney Phillips and Ryan Milner offer strategies for navigating increasingly treacherous information flows. Using ecological metaphors, they emphasize how our individual *me* is entwined within a much larger *we*, and how everyone fits within an ever-shifting network map.

Phillips and Milner describe how our poisoned media landscape came into being, beginning with the Satanic Panics of the 1980s and 1990s—which, they say, exemplify "network climate change"—and proceeding through the emergence of trolling culture and the rise of the reactionary far right (as well as its amplification by journalists) during and after the 2016 election. They explore the history of conspiracy theories in the United States, focusing on those concerning the Deep State; explain why old media literacy solutions fail to solve new media literacy problems; and suggest how we can navigate the network crisis more thoughtfully, effectively, and ethically. We need a network ethics that looks beyond the messages and the messengers to investigate toxic information's downstream effects.

Whitney Phillips is Assistant Professor in the Department of Communication and Rhetorical Studies at Syracuse University and the author of *This Is Why We Can't Have Nice Things: Mapping the Relationship between Online Trolling and Mainstream Culture* (MIT Press).
Ryan M. Milner is Associate Professor of Communication at the College of Charleston and author of *The World Made Meme: Public Conversations and Participatory Media* (MIT Press).

"Whitney Phillips and Ryan Milner have a knack for taking a topic you think you understand and then rearranging your entire worldview, leaving you gobsmacked and wanting more. This mind-bending book connects the past to the present and the digital to the environmental to reveal the roots of today's disinformation panic."
—danah boyd, author of *It's Complicated: The Social Lives of Networked Teens*

"Our country is under attack by our foreign adversaries and their domestic partners, and we need to better understand what's going on. *You Are Here* helps us do that and helps us understand how we can all stand together and fight back."
—Craig Newmark, founder of craigslist and Craig Newmark Philanthropies

Gut Feelings

The Microbiome and Our Health

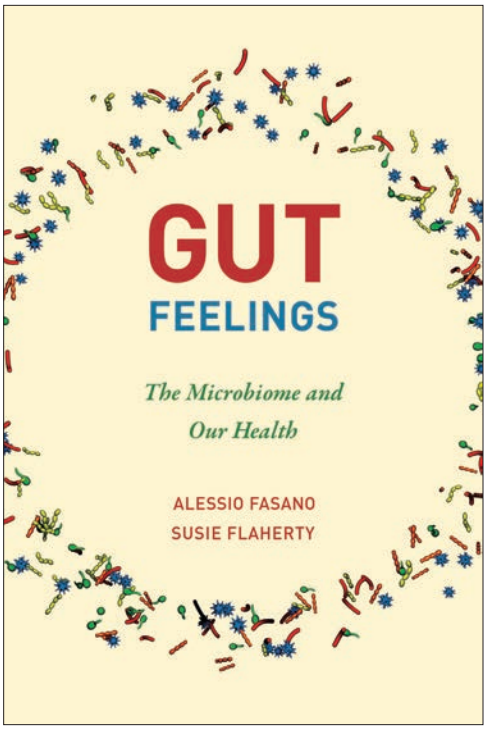
Alessio Fasano and Susie Flaherty

We are at the dawn of new scientific revolution. Our understanding of how to treat and prevent diseases has been transformed by knowledge of the microbiome—the rich ecosystem of microorganisms in and on every human. These microbial hitchhikers may hold the keys to human health. In *Gut Feelings*, Alessio Fasano and Susie Flaherty show why we must go beyond the older, myopic view of microorganisms as our enemies to a broader understanding of the microbiome as a parallel civilization that we need to understand, respect, and engage with for the benefit of our own health.

Recent advances in understanding the microbiome and its role in human health dovetail with the development of personalized or "precision" medicine to create treatments and prevention programs targeted to the molecular imprint of an individual. Fasano and Flaherty explore the microbiome's part in such diseases as gut inflammatory disorders, obesity, neurological conditions, and cancer, and they explain new research in prebiotics, probiotics, synbiotics, and psychobiotics. They also discuss the microbiome and immune function, including a possible role in COVID-19 treatment.

By simultaneously expanding our perspective to encompass large datasets and multiple factors in human health, and narrowing our focus to identify the individual communities in the human microbiome, we will enlarge—and perhaps reinvent—our understanding of how to combat disease and maintain health.

Alessio Fasano is the W. Allan Walker Chair of Pediatric Gastroenterology and Nutrition at Massachusetts General Hospital, Professor of Pediatrics at Harvard Medical School, and Professor of Nutrition at the Harvard T. H. Chan School of Public Health. He is also Founder and Director of the Center for Celiac Research and Treatment at MGH. Award-winning writer and editor **Susie Flaherty** is Director of Communications at the Center for Celiac Research and Treatment. Fasano and Flaherty are the authors of *Gluten Freedom*.



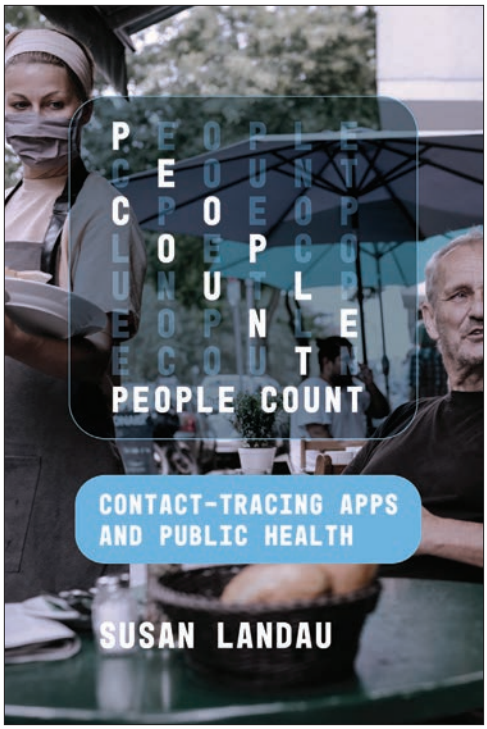
Why the microbiome—our rich inner ecosystem of microorganisms—may hold the keys to human health.

March
5 3/8 x 8, 528 pp.
9 illus.

US $27.95T/$36.95 CAN cloth
978-0-262-04427-1

Alessio Fasano

Susie Flaherty



People Count

Contact-Tracing Apps and Public Health

Susan Landau

How do you stop a pandemic before a vaccine arrives? Contact tracing is key, the first step in a process that has proven effective: trace, test, and isolate. Smartphones can collect some of the information required by contact tracers—not just where you've been but also who's been near you. Can we repurpose the tracking technology that we carry with us—devices with GPS, Wi-Fi, Bluetooth, and social media connectivity—to serve public health in a pandemic? In *People Count*, cybersecurity expert Susan Landau looks at some of the apps developed for contact tracing during the COVID-19 pandemic, finding that issues of effectiveness and equity intersect.

Landau explains the effectiveness (or ineffectiveness) of a range of technological interventions, including dongles in Singapore that collect proximity information; India's biometric national identity system; Harvard University's experiment, TraceFi; and China's surveillance network. Other nations rejected China-style surveillance in favor of systems based on Bluetooth, GPS, and cell towers, but Landau explains the limitations of these technologies. She also reports that many current apps appear to be premised on a model of middle-class income and a job that can be done remotely. How can they be effective when low-income communities and front-line workers are the ones who are hit hardest by the virus? COVID-19 will not be our last pandemic; we need to get this essential method of infection control right.

Susan Landau is Bridge Professor of Cyber Security and Policy at The Fletcher School and at the School of Engineering, Department of Computer Science, at Tufts University. She is the coauthor of *Privacy on the Line* (MIT Press) and the author of *Surveillance or Security?* (MIT Press) and *Listening In: Cybersecurity in an Insecure Age*.

An introduction to the technology of contact tracing and its usefulness for public health, considering questions of efficacy, equity, and privacy.

March
5 3/8 x 8, 120 pp.

US $24.95T/$33.95 CAN cloth
978-0-262-04571-1

Make Shift

Dispatches from the Post-Pandemic Future

Gideon Lichfield

This new volume in the Twelve Tomorrows series of science fiction anthologies looks at how science and technology—existing or speculative—might help us create a more equitable and hopeful world after the coronavirus pandemic. The original stories presented here, from a diverse collection of authors, offer no miracles or simple utopias, but visions of ingenuity, grit, and incremental improvement. In the tradition of inspirational science fiction that goes back to Isaac Asimov and Arthur C. Clarke, these writers remind us that we can choose our future, and show us how we might build it.

In these imagined futures, telepresence tourism replaces the viral dangers and environmental destruction of international travel; hackers attempt to disrupt the new quadratic voting system; robot bartenders administer vaccines; a Canadian farmer grows grain for the national rationing program; Hong Kong refugees create an augmented reality performance space for the Edinburgh Festival; a worker must choose between his daughter and his job caring for the people and environment of the locked-down and rewilded Kolkata. In addition, Wade Roush, science writer and editor of a previous Twelve Tomorrows anthology, interviews Ytasha Womack, author of *Afrofuturism* and *Post Black*, about the pandemic, racial justice, and how science fiction can help us imagine a healthier, fairer society.

Gideon Lichfield is Editor-in-Chief of *MIT Technology Review*.

Stories by
Madeline Ashby, Indrapramit Das, Cory Doctorow, Adrian Hon, Rich Larson, Ken Liu, Malka Older, Hannu Rajaniemi, Karl Schroeder, D. A. Xiaolin Spires

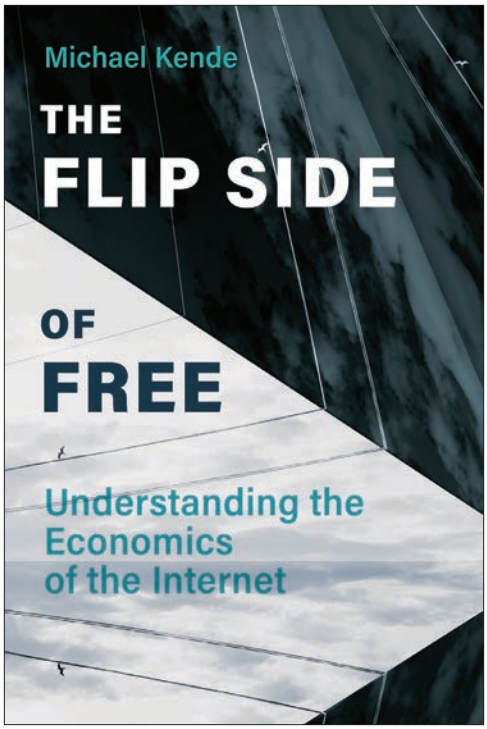
Interview
Wade Roush, Ytasha Womack

Science fiction stories of pandemic-inspired ingenuity, grit, and determination.

May
6 x 9, 176 pp.

US $19.95T/$25.95 CAN paper
978-0-262-54240-1

Twelve Tomorrows



The Flip Side of Free

Understanding the Economics of the Internet

Michael Kende

The upside of the internet is free Wi-Fi at Starbucks, Facetime over long-distances, and nearly unlimited data for downloading or streaming. The downside is that our data goes to companies that use it to make money, our financial information is exposed to hackers, and the market power of technology companies continues to increase. In *The Flip Side of Free*, Michael Kende shows that free internet comes at a price. We're beginning to realize this. Our all-purpose techno-caveat is "I love my smart phone," *but* is it really tracking everything I do? listening to everything I say?

Kende explains the unique economics of the internet and the paradoxes that result. The most valuable companies in the world are now internet companies, built on data often exchanged for free content and services. Many users know the impact of this tradeoff on privacy but continue to use the services anyway. Moreover, although the internet lowers barriers for companies to enter markets, it is hard to compete with the largest providers. We complain about companies having too much data, but developing countries without widespread internet usage may suffer from the reverse: not enough data collection for the development of advanced services—which leads to a worsening data divide between developed and developing countries.

What's the future of free? Data is the price of free service, and the new currency of the internet age. There's nothing necessarily wrong with free, Kende says, as long as we anticipate and try to mitigate what's on the flip side.

Why "free" comes at a price: the costs of free internet services in terms of privacy, cybersecurity, and the growing market power of technology giants.

March
6 x 9, 256 pp.
3 illus.

US $29.95T/$39.95 CAN cloth
978-0-262-04565-0

Michael Kende is a Senior Fellow and Visiting Lecturer at the Graduate Institute of International and Development Studies, Geneva, a Senior Adviser at Analysys Mason, a Digital Development Specialist at the World Bank Group, and former Chief Economist of the Internet Society. He has worked as an academic economist at INSEAD and as a US regulator at the Federal Communications Commission.

Michael Kende
Photo by Manon Voland

"I read this book in one sitting. So should you. Clear, balanced, nuanced and analytic. I have lived the internet story and this book put choices in a clear light."
—Vint Cerf, internet pioneer

Combating Inequality

Rethinking Government's Role

edited by Olivier Blanchard and Dani Rodrik

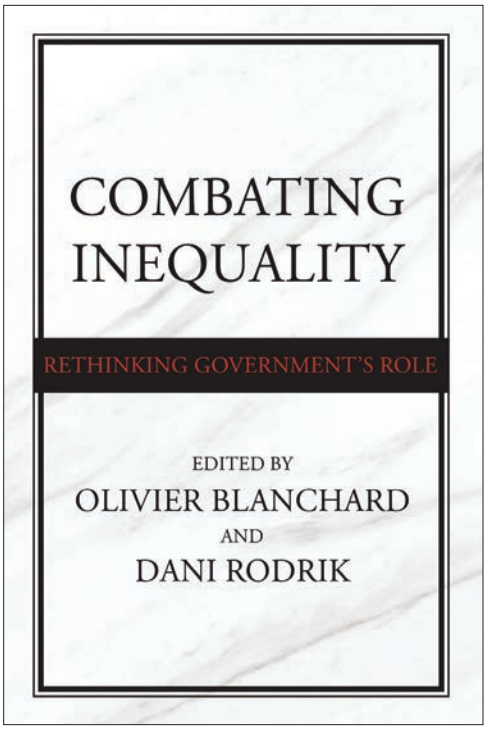
Economic inequality is the defining issue of our time. In the United States, the wealth share of the top 1% has risen from 25% in the late 1970s to around 40% today. The percentage of children earning more than their parents has fallen from 90% in the 1940s to around 50% today. In *Combating Inequality*, leading economists, many of them current or former policymakers, bring good news: we have the tools to reverse the rise in inequality. In their discussions, they consider which of these tools are the most effective at doing so.

The contributors express widespread agreement that we need to aim policies at economic inequality itself; deregulation and economic stimulus will not do the job. No longer does anyone ask, in relation to expanded social programs, "Can we pay for it?" And most believe that US taxes will have to rise—although they debate whether the progressivity should focus on the revenue side or the expenditure side, through broad-based taxes like the VAT or through a wealth tax aimed at the very top of the income scale. They also consider the philosophical aspects of inequality—whether it is bad in itself or because of its consequences; the risks and benefits of more radical interventions to change the nature of production and trade; and future policy directions.

Olivier Blanchard is C. Fred Bergsten Senior Fellow at the Peterson Institute for International Economics and Robert Solow Professor of Economics Emeritus at MIT. He was Chief Economist at the International Monetary Fund from 2008 to 2015. **Dani Rodrik** is Ford Foundation Professor of International Political Economy at Harvard's John F. Kennedy School of Government and President-Elect of the International Economic Association.

Contributors

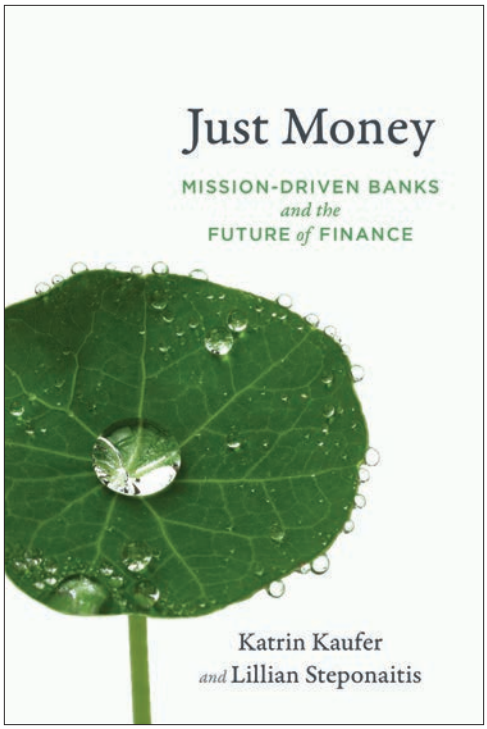
Daron Acemoglu, Philippe Aghion, Danielle Allen, Ben Ansell, David Autor, Sheri Berman, Marianne Bertrand, Olivier Blanchard, Lucas Chancel, William Darity Jr., Peter Diamond, Christian Dustmann, David T. Ellwood, Richard Freeman, Caroline Freund, Jason Furman, Hilary Hoynes, Lawrence F. Katz, Wojciech Kopczuk, N. Gregory Mankiw, Nolan McCarty, Dani Rodrik, Jesse Rothstein, Emmanuel Saez, T. M. Scanlon, Tharman Shanmugaratnam, Heidi Shierholz, Stefanie Stantcheva, Michael Stynes, Lawrence Summers, Laura D'Andrea Tyson, Philippe Van Parijs, Gabriel Zucman



Leading economists and policymakers consider what economic tools are most effective in reversing the rise in inequality.

February
6 x 9, 312 pp.
40 illus.

US $34.95T/$45.95 CAN cloth
978-0-262-04561-2



How to use finance as a tool to build a more equitable and sustainable society.

February
5 3/8 x 8, 192 pp.
4 illus.

US $17.95T/$23.95 CAN paper
978-0-262-54222-7

Just Money

Mission-Driven Banks and the Future of Finance

Katrin Kaufer and Lillian Steponaitis

Money defines our present and will shape our future. Every investment decision we make adds a chapter to the story of what our world will look like. Although the idea of mission-based finance has been around for decades, there is a gap between organizations' stated intention to "do good" and meaningful impact. Still, some are succeeding. In *Just Money*, Katrin Kaufer and Lillian Steponaitis take readers on a global tour of financial institutions that use finance as a force for good.

Kaufer and Steponaitis visit a bank in Europe that bases its business model on full transparency; a credit union in Canada that designed an alternative to payday lending for its community; and microfinance institutions in El Salvador and Bangladesh that provide financing to small-business clients who do not have access to the mainstream banking system. They discuss what it takes to build and operate a mission-focused business, whether the Just Banking model is scalable in the face of systemic barriers, and how to assess impact effectively. Finally, they introduce the logic of ecosystem finance, in which business decisions align with societal needs. Doing so requires more than adding impact indicators; it requires developing a new business model. With *Just Money*, Kaufer and Steponaitis remind us that money, if used intentionally and equitably, can be just money—a tool that serves nature, human development, and social justice.

Katrin Kaufer is Director of Just Money at the MIT Community Innovators Lab (CoLab) in MIT's Department of Urban Studies and Planning, and Executive Director of the Presencing Institute. **Lillian Steponaitis** is a Research Affiliate in the MIT Community Innovators Lab and a Special Projects Manager at the Self-Help Federal Credit Union.

Workforce Education

A New Roadmap

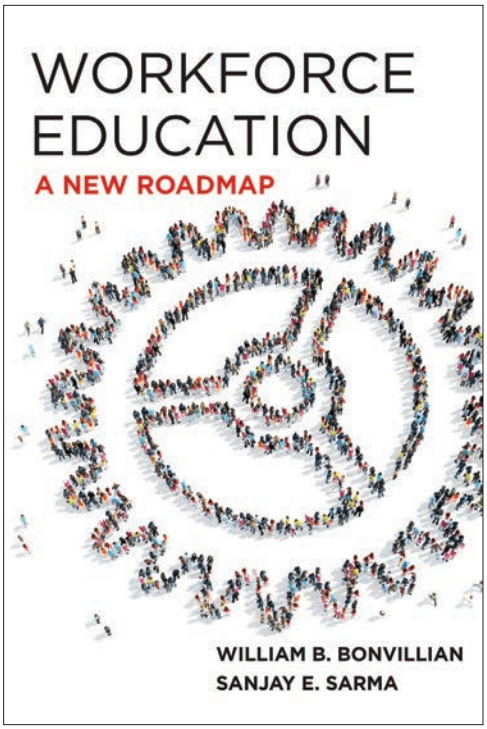
William B. Bonvillian and Sanjay E. Sarma

The American dream promised that if you worked hard, you could move up, with well-paying working-class jobs providing a gateway to an ever-growing middle class. Today, however, we have increasing inequality, not economic convergence. Technological advances are putting quality jobs out of reach for workers who lack the proper skills and training. In *Workforce Education*, William Bonvillian and Sanjay Sarma offer a roadmap for rebuilding America's working class. They argue that we need to train more workers more quickly, and they describe innovative methods of workforce education that are being developed across the country.

It's not just that we need a pipeline of skilled workers for future jobs; we need to give workers the skills they need now. Focusing on manufacturing, healthcare, and retail sectors, Bonvillian and Sarma investigate programs that reimagine workforce education, from short intensive courses that offer certification to a new model for apprenticeships. They examine the roles of community colleges, employers, governments, and universities in workforce education, and describe new education technologies that can deliver training to workers. We can't tackle inequality unless we equip our workers for twenty-first-century jobs.

William B. Bonvillian is Lecturer at MIT in the Science Technology and Society Department and Senior Director of Special Projects at MIT's Office of Digital Learning. He is the coauthor of *Structuring an Energy Technology Revolution* and *Advanced Manufacturing* (both published by the MIT Press). **Sanjay E. Sarma** is Fred Fort Flowers and Daniel Fort Flowers Professor of Mechanical Engineering at MIT, where he is also Vice President for Open Learning. He is the coauthor of *The Inversion Factor* (MIT Press) and *Grasp: The Science Transforming How We Learn*.

"Bonvillian and Sarma tackle one of the toughest, and most important problems facing the United States."
—Robert Siegel, former host of NPR's *All Things Considered*



A roadmap for how we can rebuild America's working class by transforming workforce education and training.

February
6 x 9, 368 pp.
2 illus.

US $34.95T/$45.95 CAN cloth
978-0-262-04488-2

The Monopoly of Man

Anna Kuliscioff

translated by Lorenzo Chiesa

introduction by Jamila M. H. Mascat

Anna Kuliscioff (c. 1854–1925) was a prominent figure in the revolutionary politics of her era, advocating for socialism and feminism. One of the founding members of the Italian Socialist Party, she actively contributed to the late-nineteenth-century flourishing of the Socialist International and the emergence of Italian socialism. For the last decades of her life, Kuliscioff's public militancy revolved around the "woman question." She viewed feminism through the lens of class struggle, addressing the double exploitation of women—in the workplace and at home. Kuliscioff fought a twofold battle: as a socialist, she unmasked the sexism of her colleagues; as a feminist, she criticized liberal-bourgeois feminism. In this key text, she makes her case for a socialist feminism.

Originating as a lecture Kuliscioff delivered in April 1890 at the Milan Philological Circle (which denied membership to women), *The Monopoly of Man* explicitly links feminism to labor. Kuliscioff argues that labor frees women from the prison of the household and potentially fosters their emancipation; she advances the principle of equal pay for equal work. She declares that woman is enslaved by both her husband and by capital, calls marriage a form of women's servitude, and demands that motherhood be better appreciated as work. It is only when woman is economically independent and resists capitalism, she argues, will she achieve freedom, dignity, and the respect of the other sex.

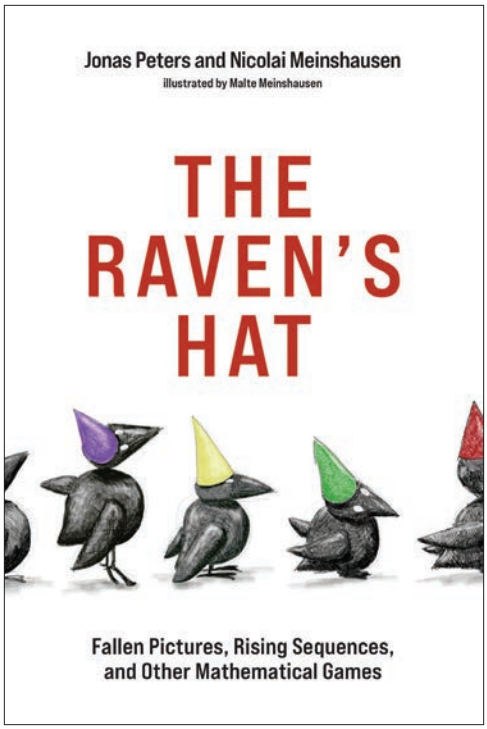
Anna Kuliscioff (c. 1854–1925) was a feminist and socialist revolutionary. Born in Crimea, she was a leading figure in the Italian socialist movement.

A key text by a leading figure in Italian socialist feminism that remains relevant today, addressing the exploitation of women in the workplace and at home.

April
5 1/4 x 8, 112 pp.

US $16.95T/$22.95 CAN cloth
978-0-262-04539-1

Insubordinations: Italian Radical Thought



The Raven's Hat

Fallen Pictures, Rising Sequences, and Other Mathematical Games

Jonas Peters and Nicolai Meinshausen

illustrated by Malte Meinshausen

This book presents a series of engaging games that seem unsolvable—but can be solved when they are translated into mathematical terms. How can players find their ID cards when the cards are distributed randomly among twenty boxes? By applying the theory of permutations. How can a player guess the color of her own hat when she can only see other players' hats? Hamming codes, which are used in communication technologies. Like magic, mathematics solves the apparently unsolvable. The games allow readers, including university students or anyone with high school–level math, to experience the joy of mathematical discovery.

The authors set up each game, specifying the number of players and props needed, and show readers how mathematical language reveals the problem's underlying structure. They explain the mathematical concepts with many examples, describe the history of the problem, and offer practical advice. Colorful and clever illustrations, featuring a flock of mathematically inclined ravens, help clarify things. All of the games can be presented to an audience; each one runs from sixty to ninety minutes, suitable for seminar presentations or lectures. The authors aim at maintaining mathematical precision while avoiding overly complex notation. Appendixes go into more detail, reviewing frequently used mathematical symbols, providing further information on a range of mathematical concepts, and offering chapter-specific mathematical explanations.

Jonas Peters is Professor of Statistics at the University of Copenhagen. **Nicolai Meinshausen** is Professor of Statistics at ETH (Swiss Federal Institute of Technology) in Zurich.

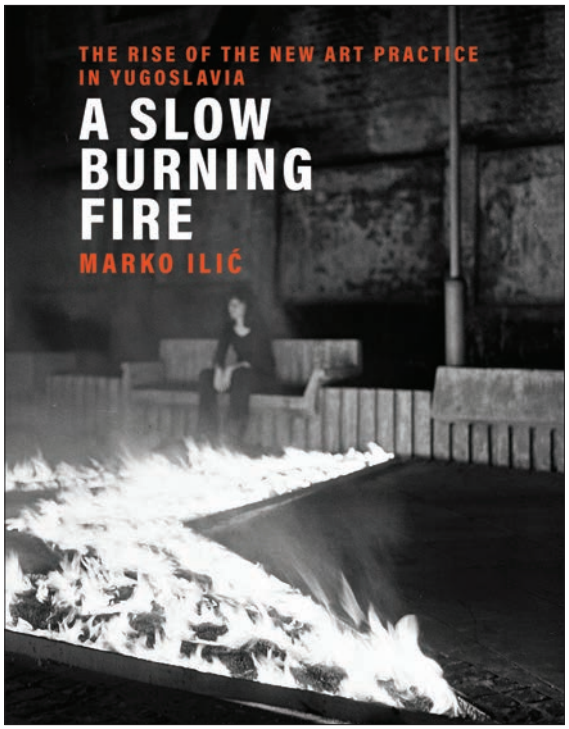
Games that show how mathematics can solve the apparently unsolvable.

February
5 3/8 x 8, 192 pp.
25 color illus., 5 b&w illus.

US $24.95T/$33.95 CAN paper
978-0-262-04451-6

"This is a fantastic book! It's full of clever and carefully constructed puzzles that will entertain any mathematically curious reader, from novice to expert."
—Richard J. Samworth, Professor of Statistical Science, University of Cambridge

"A book of intriguing problems that are simple to state and yet seem impossible to solve. Each problem has been carefully chosen to illustrate an important mathematical concept. The lucid explanations provide aha moments that connect the problems to key ideas in a wide variety of undergraduate courses. A wonderful book for someone who likes mathematics and likes to be challenged!"
—Chris Bernhardt, author of *Quantum Computing for Everyone*



The first comprehensive study of the former Yugoslavia's diverse and groundbreaking alternative art scenes from the 1960s to the 1980s.

February
7 x 9, 384 pp.
55 color illus., 75 b&w illus.

US $39.95T/$53.95 CAN cloth
978-0-262-04484-4

A Slow Burning Fire

The Rise of the New Art Practice in Yugoslavia

Marko Ilić

This first comprehensive study of the former Yugoslavia's alternative art scene tells the origin stories of some of the most significant artists of the late twentieth century. In Yugoslavia from the late 1960s to the late 1980s, state-supported Students' Cultural Centers became incubators for new art. This era's conceptual and performance art—known as Yugoslavia's New Art Practice—emerged from a network of diverse and densely interconnected art scenes that nurtured the early work of Marina Abramović, Sanja Iveković, Neue Slowenische Kunst (NSK), and others. In this book, Marko Ilić examines Yugoslavia's New Art Practice in light of the political upheavals of the 1980s.

Countering the usual binary of official versus unofficial art, Ilić shows that the Students' Cultural Centers were an expression of Yugoslavia's "third way" political and economic system, which was founded on workers' self-management. Ilić examines key actions, gestures, and propositions affiliated with the New Art Practice, including the conceptual and dematerialized art practices that emerged from Zagreb's Student Center Gallery, the struggle of Belgrade's Students' Cultural Center (where Abramović performed her career-defining *Rhythm 5*) to break into the international art scene, the pre-Žižek culture of Ljubljana, and Sarajevo's miraculous dokumenta, held in the midst of Yugoslavia's disintegration.

Ilić argues that the rise of Yugoslavia's alternative art scene both reflected on and adapted to the country's swiftly deteriorating social scene, responding to the political decentralization and economic liberalization of self-management's later phase. But of course, the future that the New Art Practice saw for Yugoslavia never came. Ilić's account is as much about hopes and ideals as it is about delusions, failed projects, and painful legacies.

Marko Ilić is an art historian based in London.

"Civil war tore Yugoslavia apart and shattered its vibrant and distinct art world. Marko Ilić's deeply researched and insightful study reconstructs it brilliantly."
—David Crowley, Professor at the National College of Art and Design, Dublin, cocurator of *Notes from the Underground: Art and Alternative Music in Eastern Europe 1968–1994*

Carrie Mae Weems

edited by Sarah Lewis

with Christine Garnier

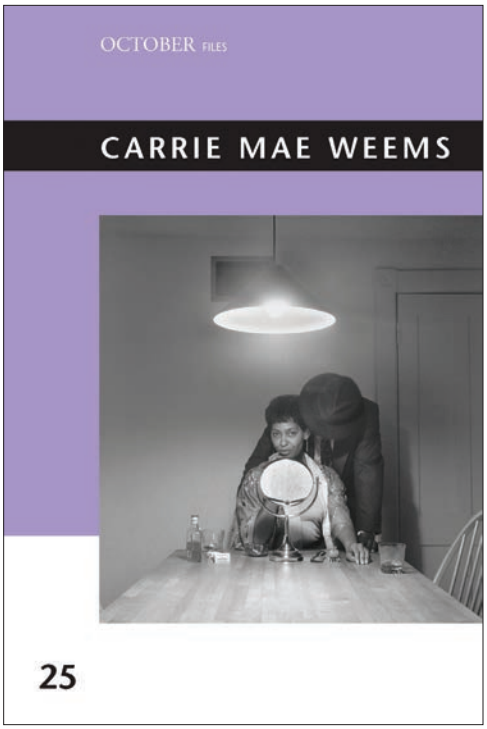
In this October Files volume, essays and interviews explore the work of the influential American artist Carrie Mae Weems—her invention and originality, the formal dimensions of her practice, and her importance to the history of photography and contemporary art. Since the 1980s, Weems (b. 1953) has challenged the status of the Black female body within the complex social fabric of American society. Her photographic work, film, and performance investigate spaces that range from the American kitchen table to the nineteenth-century world of historically Black Hampton University to the ancient landscapes of Rome.

These texts consider the underpinnings of photographic history in Weems's work, focusing on such early works as *The Kitchen Table* series; Weems's engagement with photographic archives, historical spaces, and the conceptual legacy of art history; and the relationship between her work and its institutional venues. The book makes clear not only the importance of Weems's work but also the necessity for an expanded set of concerns in contemporary art—one in which race does not restrict a discussion of aesthetics, as it has in the past, robbing Black artists of a full consideration of their work.

Sarah Lewis is Associate Professor of History of Art and Architecture and African and African American Studies at Harvard University. She is the author of of a forthcoming book on photography, race, and vision within the Black Atlantic and the Black Sea. **Christine Garnier** is a PhD candidate in History of Art and Architecture at Harvard University.

Contributors

Dawoud Bey, Jennifer Blessing, Kimberly Juanita Brown, Huey Copeland, Erina Duganne, Kimberly Drew, Coco Fusco, Thelma Golden, Katori Hall, Robin Kelsey, Thomas J. Lax, Sarah Lewis, Jeremy McCarter, Yxta Maya Murray, José Rivera, Gwendolyn DuBois Shaw, Salamishah Tillet, Deborah Willis



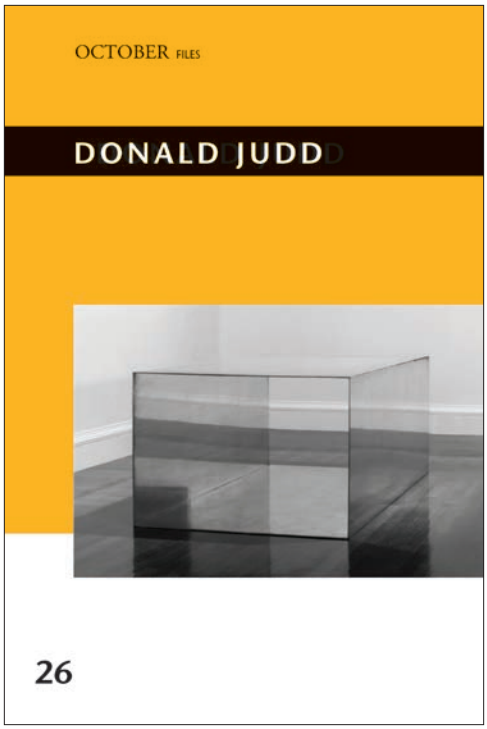
Essays and interviews explore the work of Carrie Mae Weems and its place in the history of photography, African American art, and contemporary art.

May
6 x 9, 184 pp.
46 illus.

US $24.95T/$33.95 CAN paper
978-0-262-53859-6

US $45.00X/$60.00 CAN cloth
978-0-262-04376-2

October Files



Donald Judd

edited by Annie Ochmanek and Alex Kitnick

Donald Judd (1928–1994) was one of the most influential American artists of the postwar era. Beginning in the 1960s, he developed new ideas about art—in both his works and writings—that challenged many of modernism's core tenets by resisting the categories of painting and sculpture. Judd described this work as "specific objects." Critics labeled it minimalism. Perhaps because Judd's own writings provide a discursive framework for his project, some of the monographic essays on his art are not widely known. This volume collects critical and scholarly writings on Judd, examining his work as both artist and critic.

Spanning all periods of Judd's career, the essays gathered in this volume explore questions of abstraction, phenomenology, political engagement, labor, urban planning, and conservation. Written by a range of artists, architects, art historians, critics, and curators, these texts make clear Judd's relevance for a wide array of fields and disciplines, and situate him as a pivotal figure in contemporary art. They include an early consideration of Judd's work by Robert Smithson, a text on Judd's later works by curator Lynne Cooke, two essays by the art historian Rosalind Krauss, and an appraisal of Judd's writings by the artist Mel Bochner.

Annie Ochmanek is a PhD candidate at Columbia University and former Curatorial Assistant at the Museum of Modern Art, where she worked on the 2020 Judd retrospective. **Alex Kitnick** is Assistant Professor of Art History and Visual Culture at Bard College and the editor of a previous October Files volume, *Dan Graham* (MIT Press).

Contributors

Elizabeth C. Baker, Karl Beveridge, Mel Bochner, Yve-Alain Bois, Ian Burn, Lynne Cooke, Rosalind E. Krauss, Michael Meredith, Joshua Shannon, Robert Slifkin, Robert Smithson, Ann Temkin, Brian Walls

Artists, architects, art historians, critics, and curators explore the work of Donald Judd as both artist and critic in essays spanning all of Judd's career.

February
6 x 9, 224 pp.
30 illus.

US $24.95T/$33.95 CAN paper
978-0-262-53945-6

US $60.00X/$79.00 CAN cloth
978-0-262-04450-9

October Files

Cycling for Sustainable Cities

edited by Ralph Buehler and John Pucher

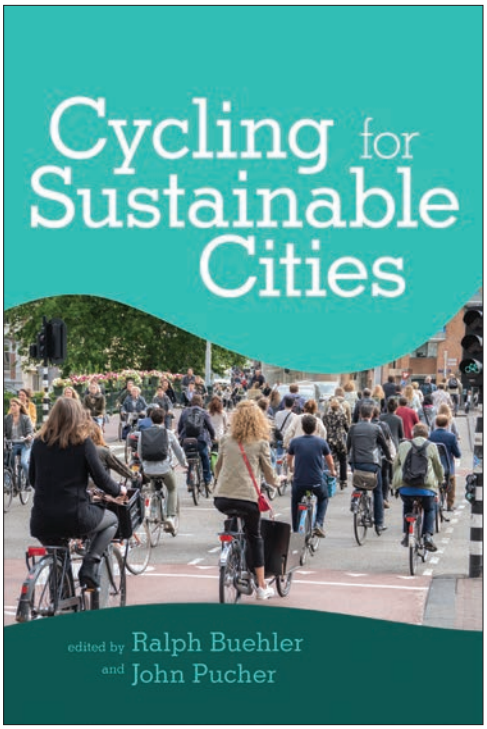
Cycling is the most sustainable means of urban travel, feasible for most short- and medium-distance trips and for many practical purposes—commuting to and from work and school, shopping, visiting friends—as well as for recreation and exercise. Cycling promotes physical, social, and mental health, helps reduce car use, enhances mobility and independence, and is economical for both public and personal budgets. Cycling should be made feasible for everyone and not limited to especially fit, daring, well-trained cyclists riding expensive bicycles. *Cycling for Sustainable Cities* shows how to make city cycling safe, practical, and convenient for all ages and abilities.

After discussing the latest cycling trends and policies around the world, contributors consider specific aspects of cycling. They examine such topics as health benefits; cycling facilities, including traffic-protected bike lanes; cycling incentives; the needs and preferences of women, children, and older adults; and equity and social justice. Expanding on the earlier book, *City Cycling*, they explore cycling developments in Asia and Latin America and analyze cycling evolution and innovations in New York, London, Paris, Amsterdam, Copenhagen, Portland (Oregon), and Sevilla. Taken together, the chapters show that successful promotion of cycling depends on a coordinated package of mutually supportive infrastructure, programs, and policies.

Ralph Buehler is Professor and Chair of Urban Affairs and Planning in the School of Public and International Affairs at Virginia Tech's Research Center in Arlington, Virginia. **John Pucher** is Professor Emeritus in the Urban Planning and Policy Development Program at Rutgers University's Edward J. Bloustein School of Planning and Public Policy. Buehler and Pucher are coeditors of *City Cycling* (MIT Press).

Contributors

Adrian Bauman, Tim Blumenthal, Peter Bourke, Marco te Brömmelstroet, Ralph Buehler, Fiona Campbell, Rong Cao, Chris Cherry, Andy Clarke, Jennifer Conroy, Billie Giles-Corti, Emmanuel de Lanversin, Rune Elvik, Bernhard Ensink, Elliot Fishman, Peter G. Furth, Yuan Gao, Jan Garrard, Roger Geller, Aaron Golub, Andrea Hamre, Susan Handy, Eva Heinen, Till Koglin, Eleftheria Kontou, Ricardo Marqués, Karel Martens, Noreen C. McDonald, Ken McLeod, Kazuki Nakamura, Bill Nesper, Carlos-Felipe Pardo, John Parkin, Zhong-Ren Peng, Jean-François Pronovost, John Pucher, Lina Quiñones, Chris Rissel, Daniel A. Rodriguez, Susan A. Shaheen, Dave Snyder, Robin Stallings, Geetam Tiwari, Bert van Wee, Meghan Winters



How to make city cycling—the most sustainable means of travel—safe, practical, and convenient for all.

February
6 x 9, 488 pp.
53 illus.

US $30.00X/$40.00 CAN paper
978-0-262-54202-9

Urban and Industrial Environments series

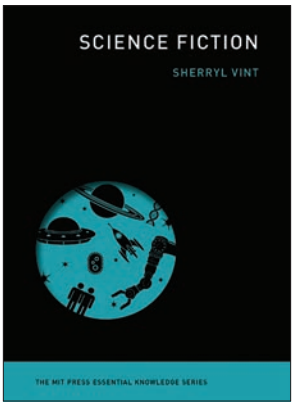
science fiction | cultural studies

Science Fiction

Sherryl Vint

How science fiction has been a tool for understanding and living through rapid technological change.

The world today seems to be slipping into a science fiction future. We have phones that speak to us, cars that drive themselves, and connected devices that communicate with each other in languages we don't understand. Depending on the news of the day, we inhabit either a technological utopia or a *Brave New World* nightmare. This volume in the MIT Press Essential Knowledge series surveys the uses of science fiction. It focuses on what is at the core of all definitions of science fiction: a vision of the world made otherwise and what possibilities might flow from such otherness.



After a brief overview of the genre's origins, science fiction authority Sherryl Vint considers how and why contemporary science fiction is changing. She explores anxieties in current science fiction over such key sites of technological innovation as artificial intelligence, genomic research and commodified biomedicine, and climate change. Connecting science fiction with speculative design and futurology in the corporate world, she argues that science fiction does not merely reflect these trends, but has a role in directing them.

Sherryl Vint is Professor of Media and Cultural Studies and of English at the University of California, Riverside. She is the author of *Bodies of Tomorrow*, *Animal Alterity*, and *Science Fiction: A Guide for the Perplexed*, coauthor of the *Routledge Concise History of Science Fiction*, and coeditor of *The Routledge Companion to Science Fiction*.

February | 5 x 7, 224 pp.

US $15.95T/$21.95 CAN paper
978-0-262-53999-9

The MIT Press Essential Knowledge series

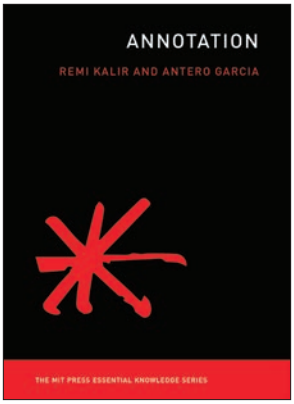
reference | cultural studies

Annotation

Remi Kalir and Antero Garcia

An introduction to annotation as a genre—a synthesis of reading, thinking, writing, and communication—and its significance in scholarship and everyday life.

Annotation—the addition of a note to a text—is an everyday and social activity that provides information, shares commentary, sparks conversation, expresses power, and aids learning. It helps mediate the relationship between reading and writing. This volume in the MIT Press Essential Knowledge series offers an introduction to annotation and its literary, scholarly, civic, and everyday significance across historical and contemporary contexts. It approaches annotation as a genre—a synthesis of reading, thinking, writing, and communication—and offers examples of annotation that range from medieval rubrication and early book culture to data labeling and online reviews.



After introducing such ideas as paratext, multimodality, and intertextuality, the authors discuss the affordances and types of annotation in a variety of contexts. Annotation that provides information, for example, can be a time stamp on a text message or a footnote to a text; annotation that shares commentary can be praise (or the opposite) on Rate My Professors or the texts in the Hebrew Talmud; and annotation that aids learning can be added by experts for students or by students for their peers. Far from being an arcane practice of scholars, annotation allows readers to respond to their texts, interact with various forms of media, and make meaning with and from this everyday activity.

Remi Kalir is Assistant Professor of Learning Design and Technology at the University of Colorado Denver School of Education and Human Development. **Antero Garcia** is Assistant Professor of Education at Stanford University's Graduate School of Education. He is the author of *Good Reception: Teens, Teachers, and Mobile Media in a Los Angeles High School* (MIT Press).

April | 5 x 7, 232 pp.

US $15.95T/$21.95 CAN paper
978-0-262-53992-0

The MIT Press Essential Knowledge series

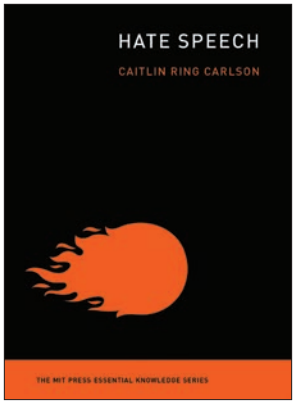
social science | politics

Hate Speech

Caitlin Ring Carlson

An investigation of hate speech: legal approaches, current controversies, and suggestions for limiting its spread.

Hate speech can happen anywhere—in Charlottesville, Virginia, where young men in khakis shouted, "Jews will not replace us"; in Myanmar, where the military used Facebook to target the Muslim Rohingya; in Capetown, South Africa, where a pastor called on ISIS to rid South Africa of the "homosexual curse." In person or online, people wield language to attack others for their race, national origin, religion, gender, gender identity, sexual orientation, age, disability, or other aspects of identity. This volume in the MIT Press Essential Knowledge series examines hate speech: what it is, and is not; its history; and efforts to address it.



Author Caitlin Ring Carlson, an expert in communication and mass media, defines hate speech as any expression—spoken words, images, or symbols—that seeks to malign people for their immutable characteristics. Hate speech is not synonymous with offensive speech—saying that you do not like someone does not constitute hate speech—or hate crimes, which are criminal acts motivated by prejudice. Hate speech traumatizes victims and degrades societies that condone it. Carlson investigates legal approaches taken by the EU, Brazil, Canada, Germany, Japan, South Africa, and the United States, with a detailed discussion of how the U.S. addresses, and in most cases, allows, hate speech. She explores recent hate speech controversies, and suggests ways that governments, colleges, media organizations, and other organizations can limit the spread of hate speech.

Caitlin Ring Carlson is Associate Professor of Communication at Seattle University.

April | 5 x 7, 200 pp. | 7 illus.

US $15.95T/$21.95 CAN paper
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The MIT Press Essential Knowledge series

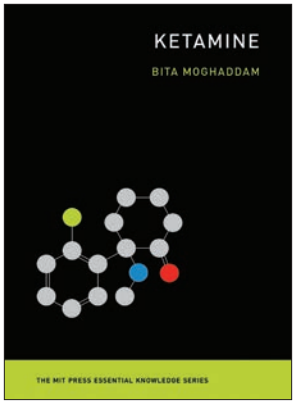
neuroscience

Ketamine

Bita Moghaddam

The emergence of ketamine—previously known as a combat anesthetic and club drug—as a treatment for depression.

Ketamine, approved in 2019 by the Food and Drug Administration for the treatment of depression, has been touted by scientists and media reports as something approaching a miracle cure. This volume in the MIT Press Essential Knowledge series chronicles the ascent of a drug that has been around for fifty years—in previous incarnations, a Vietnam-era combat anesthetic and a popular club drug—that has now been reinvented as a treatment for depression. Bita Moghaddam, a leading researcher in neuropharmacology, explains the scientific history and the biology of ketamine, its clinical use, and its recently discovered antidepressant properties, for the nonspecialist reader.



Despite the excitement, Moghaddam points out, concerns exist over the unknown long-term effects of the drug; the FDA assigned ketamine a "black box" warning—its most serious safety warning. Moghaddam describes the discovery of ketamine, how it was tested on humans, and how it is used as an anesthetic, club drug, and research tool. She explains ketamine's effects on brain receptors and neurotransmitters; its emergence as an antidepressant; and theories about its antidepressant properties. Finally, she reviews safety concerns and considers future directions for research, discussing whether what we learn about ketamine will change the way we understand and treat psychiatric disorders.

Bita Moghaddam is a leading researcher in the field of neuropsychopharmacology. She is Ruth Matarazzo Professor of Behavioral Neuroscience at Oregon Health and Science University in Portland.

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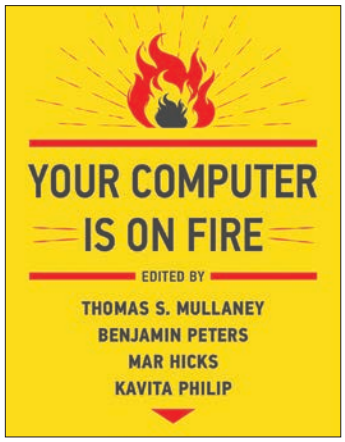
computer science

Your Computer Is on Fire

edited by Thomas S. Mullaney, Benjamin Peters, Mar Hicks, and Kavita Philip

Techno-utopianism is dead: Now is the time to pay attention to the inequality, marginalization, and biases woven into our technological systems.

This book sounds an alarm: after decades of being lulled into complacency by narratives of technological utopianism and neutrality, people are waking up to the large-scale consequences of Silicon Valley–led technophilia. This book trains a spotlight on the inequality, marginalization, and biases in our technological systems, showing how they are not just minor bugs to be patched, but part and parcel of ideas that assume technology can fix—and control—society.



The essays in *Your Computer Is on Fire* interrogate how our human and computational infrastructures overlap, showing why technologies that centralize power tend to weaken democracy. These practices are often kept out of sight until it is too late to question the costs of how they shape society. From energy-hungry server farms to racist and sexist algorithms, the digital is always IRL, with everything that happens online or algorithmically having effects on our offline lives as well. Each essay proposes paths for action to understand and solve technological problems that are often ignored or misunderstood.

Thomas S. Mullaney is Professor of History at Stanford University and the author of *The Chinese Typewriter* (MIT Press). **Benjamin Peters** is Hazel Rogers Associate Professor and Chair of Media Studies at the University of Tulsa and the author of *How Not To Network a Nation* (MIT Press). **Mar Hicks** is Associate Professor of History at Illinois Institute of Technology and the author of *Programmed Inequality* (MIT Press). **Kavita Philip** is Professor of History at the University of California, Irvine, and the author of *Studies in Unauthorized Reproduction* (MIT Press).

March | 7 x 9, 416 pp. | 24 illus.

US $35.00X/$47.00 CAN paper
978-0-262-53973-9

information science

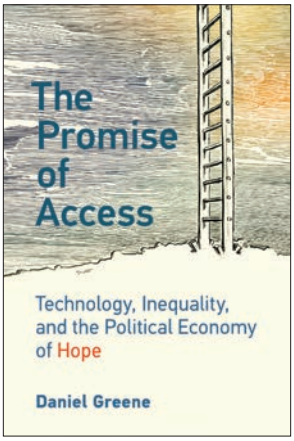
The Promise of Access

Technology, Inequality, and the Political Economy of Hope

Daniel Greene

Why simple technological solutions to complex social issues continue to appeal to politicians and professionals who should (and often do) know better.

Why do we keep trying to solve poverty with technology? What makes us feel that we need to learn to code—or else? In *The Promise of Access*, Daniel Greene argues that the problem of poverty became a problem of technology in order to manage the contradictions of a changing economy. Greene shows how the digital divide emerged as a policy problem and why simple technological solutions to complex social issues continue to appeal to politicians and professionals who should (and often do) know better.



Greene shows why it is so hard to get rid of the idea—which he terms the access doctrine—that the problem of poverty can be solved with the right tools and the right skills. This way of thinking is so ingrained that is adopted by organizations that fight poverty—which often refashion themselves to resemble technology startups. Drawing on years of fieldwork, Greene explores how this plays out in the real world, examining organizational change in technology startups, public libraries, and a charter school in Washington, DC. He finds that as the libraries and school pursue technological solutions, they win praise and funding but also marginalize and alienate the populations they serve. Greene calls for new political alliances that can change the terms on which we understand technology and fight poverty.

Daniel Greene is Assistant Professor at the University of Maryland's iSchool, where he is also a Senior Fellow at UMD's Center for the Advanced Study of Communities and Information.

April | 6 x 9, 248 pp.

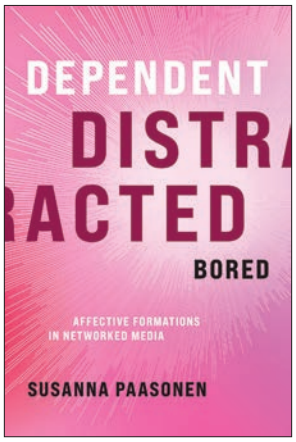
US $30.00X/$40.00 CAN paper
978-0-262-54233-3

Dependent, Distracted, Bored

Affective Formations in Networked Media

Susanna Paasonen

A new approach to understanding the culture of ubiquitous connectivity, arguing that our dependence on networked infrastructure does not equal addiction.



In this book, Susanna Paasonen takes on a dominant narrative repeated in journalistic and academic accounts for more than a decade: that we are addicted to devices, apps, and sites designed to distract us, that drive us to boredom, with detrimental effect on our capacities to focus, relate, remember, and be. Paasonen argues instead that network connectivity is a matter of infrastructure and necessary for the operations of the everyday. Dependencies on it do not equal addiction but speak to the networks within which our agency can take shape.

Paasonen explores three affective formations—dependence, distraction, and boredom—as key to understanding both the landscape of contemporary networked media and the concerns connected to it. Examining social media platforms, mindfulness apps, clickbaits, self-help resources, research reports, journalistic accounts, academic assessments, and student accounts of momentary mundane technological failure, she finds that the overarching narrative of addicted, distracted, and bored users simply does not account for the multiplicity of things at play. Frustration and pleasure, dependence and sense of possibility, distraction and attention, boredom, interest, and excitement enmesh, oscillate, enable, and depend on one another. Paasonen refutes the idea that authenticity can be associated with lives led "off the grid" and rejects the generational othering and scapegoating of smart devices prescribed by conventional wisdom.

Susanna Paasonen is Professor of Media Studies at University of Turku, Finland, and the author of *Carnal Resonance: Affect and Online Pornography* and the coauthor of *NSFW: Sex, Humor, and Risk in Social Media* and *Who's Laughing Now: Feminist Tactics in Social Media*, all published by the MIT Press.

April | 6 x 9, 208 pp. | 8 illus.

US $30.00X/$40.00 CAN cloth
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Putting Skill to Work

How to Create Good Jobs in Uncertain Times

Nichola Lowe

An argument for reimagining skill in a way that can extend economic opportunity to workers at the bottom of the labor market.

America has a jobs problem—not enough well-paying jobs to go around and not enough clear pathways leading to them. Skill development is critical for addressing this employment crisis, but there are many unresolved questions about who has skill, how it is attained, and whose responsibility it is to build skills over time. In this book, Nichola Lowe tells the stories of pioneering workforce intermediaries—nonprofits, unions, community colleges—that harness this ambiguity around skill to extend economic opportunity to workers at the bottom of the labor market.

Skill development confers shared value to both workers and employers because it lies at the intersection of their respective interests. Connecting skill to economic inequality, Lowe calls for solutions that push employers to accept greater responsibility for skill development. She examines real-world examples of workplace intermediaries throughout the United States, exploring in detail the work of manufacturing-focused organizations in Chicago, Milwaukee, and a network of community colleges in North Carolina that coordinates training for biopharmaceutical manufacturers.

As workforce intermediaries help employers reinterpret skill, they also convince them to implement inclusive work-based systems that extend family-sustaining wages and better working conditions across the entire workforce. With renewed policy emphasis on skill development, these opportunity-rich solutions can be further expanded—ensuring workers across the entire educational spectrum contribute skills that drive innovation forward and share the gains they generate for the twenty-first century workplace.

Nichola Lowe is Professor in City and Regional Planning at the University of North Carolina at Chapel Hill.

March | 6 x 9, 192 pp. | 3 illus.

US $35.00X/$47.00 CAN cloth
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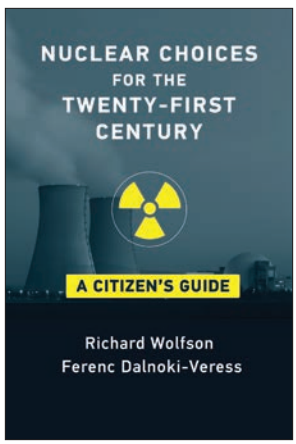
Nuclear Choices for the Twenty-First Century

A Citizen's Guide

Richard Wolfson and Ferenc Dalnoki-Veress

An authoritative and unbiased guide to nuclear technology and the controversies that surround it.

Are you for nuclear power or against it? What's the basis of your opinion? Did you know a CT scan gives you some 2 millisieverts of radiation? Do you know how much a millisievert is? Does irradiation make foods safer or less safe? What is the point of a bilateral Russia–US nuclear weapons treaty in a multipolar world? These are nuclear questions that call for nuclear choices, and this book equips citizens to make these choices informed ones. It explains, clearly and accessibly, the basics of nuclear technology and describes the controversies surrounding its use.



The book begins with scientific issues, covering the nature of the atom and its nucleus, nuclear radiation, and nuclear energy. It discusses nuclear power, the operation of nuclear power plants, nuclear accidents, nuclear waste, and alternatives to nuclear energy and considers nuclear weapons: strategies for use and non-use, controlling the spread of these weapons to other countries and terrorist groups, and the prevention of nuclear war. *Nuclear Choices for the Twenty-First Century* offers readers an authoritative and unbiased guide to difficult questions.

Richard Wolfson is Benjamin F. Wissler Professor of Physics at Middlebury College. **Ferenc Dalnoki-Veress** is Scientist-in-Residence at the Center for Nonproliferation Studies of the Middlebury Institute of International Studies.

"A comprehensive introduction to nuclear issues written in a simple and engaging style but containing such a wealth of information that experts too can learn interesting things."
—Frank N. von Hippel, Senior Research Physicist and Professor of Public and International Affairs Emeritus, Program on Science and Global Security, Princeton University

March | 6 x 9, 488 pp. | 150 figures

US $40.00X/$54.00 CAN paper
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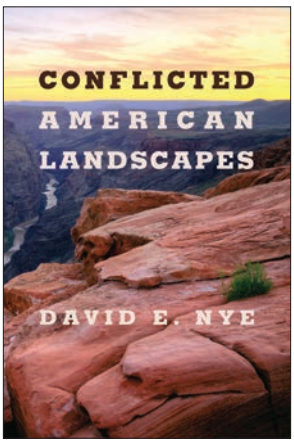
science, technology, and society | environment

Conflicted American Landscapes

David E. Nye

How conflicting ideas of nature threaten to fracture America's identity.

Amber waves of grain, purple mountain majesties: Americans invest much of their national identity in sites of natural beauty. And yet American lands today are torn by conflicts over science, religion, identity, and politics. Creationists believe that the biblical flood carved American landscapes less than ten thousand years ago; environmentalists protest pipelines; Western states argue that the federal government's land policies throttle free enterprise; Native Americans demand protection for sacred sites. In this book, David Nye looks at Americans' irreconcilable ideas about nature.



A landscape is conflicted when different groups have different uses for the same location—for example, when some want to open mining sites that others want to preserve or when suburban development impinges on agriculture. Some landscapes are so degraded from careless use that they become toxic "anti-landscapes." Nye traces these conflicts to clashing conceptions of nature—ranging from pastoral to Native American to military–industrial—that cannot be averaged into a compromise. Nye argues that today's environmental crisis is rooted in these conflicting ideas about land. Depending on your politics, global warming is either an inconvenient truth or fake news. America's contradictory conceptions of nature are at the heart of a broken national consensus.

David E. Nye is Senior Research Fellow at the Charles Babbage Institute at the University of Minnesota and Professor Emeritus of American Studies at the University of Southern Denmark. His other books published by the MIT Press include *American Technological Sublime* and *American Illuminations*. He was awarded the Leonardo da Vinci Medal in 2005 and was knighted by the Queen of Denmark in 2013.

April | 6 x 9, 256 pp. | 40 illus.

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The Untold Story of the World's Leading Environmental Institution

UNEP at Fifty

Maria Ivanova

foreword by John W. McDonald

The past, present, and possible future of the agency designed to act as "the world's environmental conscience."

The United Nations Environmental Programme (UNEP) was founded in 1972 as a nimble, fast, and flexible entity at the core of the UN system—a subsidiary body rather than a specialized agency. It was intended to be the world's environmental conscience, an anchor institution that established norms and researched policy, leaving it to other organizations to carry out its recommendations. In this book, Maria Ivanova offers a detailed account of UNEP's origin and history and a vision for its future. Ivanova counters the common criticism that UNEP was deficient by design, arguing that UNEP has in fact delivered on much (though not all) of its mandate.

Drawing on extensive interviews she conducted with UNEP's past and present Executive Directors, staff, and two former UN Secretaries-General, Ivanova provides rare insight into the organization's functioning. She shows that UNEP was able to resolve problems and launch important processes when it had financial and political support. Its failures and limitations came when the environment slipped as a priority, leadership faltered, and connectivity was challenged. UNEP's fiftieth anniversary, Ivanova argues, presents an opportunity for reinvention. She envisions a future UNEP that is the go-to institution for information on the state of the planet, a normative vision of global environmental governance, and support for domestic environmental agendas.

Maria Ivanova is Associate Professor of Global Governance and Director of the Center for Governance and Sustainability at the John W. McCormack Graduate School of Public Policy and Global Studies at the University of Massachusetts Boston. Ivanova is also a visiting scholar at the Climate CoLab at MIT Sloan School of Management.

February | 6 x 9, 376 pp. | 29 illus.

US $30.00X/$40.00 CAN paper
978-0-262-54210-4

One Planet series

Making Games

The Politics and Poetics of Game Creation Tools

Stefan Werning

An argument that production tools shape the aesthetics and political economy of games as an expressive medium.

In *Making Games*, Stefan Werning considers the role of tools (primarily but not exclusively software), their design affordances, and the role they play as sociotechnical actors. Drawing on a wide variety of case studies, Werning argues that production tools shape the aesthetics and political economy of games as an expressive medium. He frames game-making as a (meta)game in itself and shows that tools, like games, have their own "procedural rhetoric" and should not always be conceived simply in terms of optimization and best practices.

Considering tools conceptually rather than examining the function of particular tools, Werning offers a new way to think about game development. He employs an expansive definition of tools, outlining four characteristics: tool use occurs all across the value chain of the digital games industry, not just in game creation; tools are manipulatable and shareable objects; tools shape the relationships between different stakeholders; and tools meaningfully frame the purpose for which they are intended. Werning develops this theoretical framework through a series of "tool essays" that reaffirm the direct connection between playing and making games, covering such topics as metaphors of control, tool fandom, playful appropriation of tools, worldbuilding, and the subversive use of character customization tools. Finally, he calls for evocative tool design, envisioning games not just as products but as a form of expression and reflection.

Stefan Werning is Associate Professor for Digital Media and Game Studies at Utrecht University. He has worked in the digital games industry, most notably at Codemasters and Nintendo of Europe.

February | 5 3/8 x 8, 176 pp. | 18 illus.

US $25.00X/$34.00 CAN cloth
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Playful Thinking series

A Citizen's Guide to Artificial Intelligence

John Zerilli

with John Danaher, James Maclaurin, Colin Gavaghan, Alistair Knott, Joy Liddicoat, and Merel Noorman

A concise but informative overview of AI ethics and policy.

Artificial intelligence, or AI for short, has generated a staggering amount of hype in the past several years. Is it the game-changer it's been cracked up to be? If so, how is it changing the game? How is it likely to affect us as customers, tenants, aspiring homeowners, students, educators, patients, clients, prison inmates, members of ethnic and sexual minorities, and voters in liberal democracies? Authored by experts in fields ranging from computer science and law to philosophy and cognitive science, this book offers a concise overview of moral, political, legal, and economic implications of AI. It covers the basics of AI's latest permutation, machine learning, and considers issues such as transparency, bias, liability, privacy, and regulation.

Both business and government have integrated algorithmic decision support systems into their daily operations, and the book explores the implications for our lives as citizens. For example, do we take it on faith that a machine knows best in approving a patient's health insurance claim or a defendant's request for bail? What is the potential for manipulation by targeted political ads? How can the processes behind these technically sophisticated tools ever be transparent? The book discusses such issues as statistical definitions of fairness, legal and moral responsibility, the role of humans in machine learning decision systems, "nudging" algorithms and anonymized data, the effect of automation on the workplace, and AI as both regulatory tool and target.

John Zerilli is a Research Fellow at the Leverhulme Centre for the Future of Intelligence in the University of Cambridge and from 2021 a Leverhulme Trust Fellowship recipient at the University of Oxford.

February | 6 x 9, 232 pp.

US $40.00X/$54.00 CAN cloth
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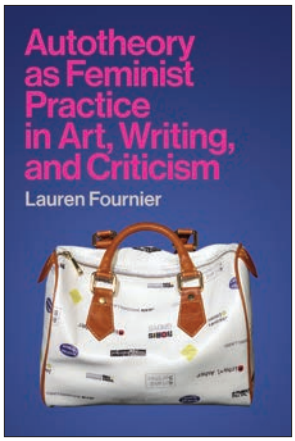
Autotheory as Feminist Practice in Art, Writing, and Criticism

Lauren Fournier

Autotheory—the commingling of theory and philosophy with autobiography—as a mode of critical artistic practice indebted to feminist writing and activism.

In the 2010s, the term "autotheory" began to trend in literary spheres, where it was used to describe books in which memoir and autobiography fused with theory and philosophy. In this book, Lauren Fournier extends the meaning of the term, applying it to other disciplines and practices. Fournier provides a long-awaited account of autotheory, situating it as a mode of contemporary, post-1960s artistic practice that is indebted to feminist writing, art, and activism. Investigating a series of works by writers and artists including Chris Kraus and Adrian Piper, she considers the politics, aesthetics, and ethics of autotheory.



Fournier argues that the autotheoretical turn signals the tenuousness of illusory separations between art and life, theory and practice, work and the self—divisions long blurred by feminist artists and scholars. Autotheory challenges dominant approaches to philosophizing and theorizing while enabling new ways for artists and writers to reflect on their lives. She argues that Kraus's 1997 *I Love Dick* marked the emergence of a newly performative, post-memoir "I"; recasts Piper's 1971 performance work *Food for the Spirit* as autotheory; considers autotheory as critique; examines practices of citation in autotheoretical work, including Maggie Nelson's *The Argonauts*; and looks at the aesthetics and ethics of disclosure and exposure, exploring the nuanced feminist politics around autotheoretical practices and such movements as #MeToo. Fournier formulates autotheory as a reflexive movement, connecting thinking, making art, living, and theorizing.

Lauren Fournier, a writer, independent curator, and artist, teaches critical theory, art history, and artists' writing at the University of Toronto, where she is a postdoctoral fellow in visual studies.

February | 6 x 9, 456 pp. | 48 color illus., 6 b&w illus.

US $35.00X/$47.00 CAN cloth
978-0-262-04556-8

biomedicine | evolution

Rethinking Cancer

A New Paradigm for the Postgenomics Era

edited by Bernhard Strauss, Marta Bertolaso, Ingemar Ernberg, and Mina J. Bissell

Leading scientists argue for a new paradigm for cancer research, proposing a complex systems view of cancer supported by empirical evidence.

Current consensus in cancer research explains cancer as a disease caused by specific mutations in certain genes. After dramatic advances in genome sequencing, never before have we known so much about the individual cancer cell—and yet never before has it been so unclear how to use this knowledge for treatment success. In this volume, leading researchers argue for a new theory framework for understanding and treating cancer. The contributors propose a complex systems view of cancer, presenting conceptual building blocks for a new research paradigm supported by empirical evidence.

The contributors first discuss the new research framework in terms of theoretical foundations and then take up the relevance of a systems approach, reviewing such topics as nonlinearity, recurrence after treatment, the cellular attractor concept, network theory, and non-coding DNA—the "dark matter" of our genome. They address the temporality of cancer progression, drawing on evolutionary theory and clinical experience. Finally, they cover the dominant role of the tissue microenvironment in cancer, analyzing topics including altered metabolic pathways, the disease-defining influence on metastasis, and the interconnectedness of different environmental niches across levels of organization.

Bernhard Strauss is Senior Research Associate in the Department of Biochemistry at the University of Cambridge. **Marta Bertolaso** is Associate Professor of Philosophy of Science in the Faculty of Engineering at Università Campus Bio-Medico in Rome. **Ingemar Ernberg** is Professor of Tumor Biology at the Department of Microbiology, Tumor, and Cell Biology at the Karolinska Institutet in Stockholm. **Mina J. Bissell** is Distinguished Scientist in the Biological Systems and Engineering Division at Lawrence Berkeley National Laboratory.

Contributors

David Basanta, Marta Bertolaso, Kimberly J. Bussey, Luca V. Cappelli, Peter Csermely, Paul C.W. Davies, Ingemar Ernberg, Sui Huang, Giorgio Inghirami, Christoph A. Klein, Courtney König, Andriy Marusyk, Thea J. Newman, Larry Norton, Roger Oria, Laxmi Parida,Jacques Pouysségur, Kahn Rhrissorrakrai, Jacob Scott, Bernhard Strauss, Dhruv Thakar, Emmy W. Verschuren, Valerie M. Weaver, Liron Yoffe, Maša Ždralević

April | 7 x 9, 456 pp. | 34 illus.

US $60.00X/$79.00 CAN cloth
978-0-262-04521-6

Vienna Series in Theoretical Biology

biomedicine | evolution

How Molecular Forces and Rotating Planets Create Life

The Emergence and Evolution of Prokaryotic Cells

Jan Spitzer

A reconceptualization of origins research that exploits a modern understanding of non-covalent molecular forces that stabilize living prokaryotic cells.

Scientific research into the origins of life remains exploratory and speculative. Science has no definitive answer to the biggest questions—"What is life?" and "How did life begin on earth?" In this book, Jan Spitzer reconceptualizes origins research by exploiting a modern understanding of non-covalent molecular forces and covalent bond formation—a physicochemical approach propounded originally by Linus Pauling and Max Delbrück. Spitzer develops the Pauling–Delbrück premise as a physicochemical jigsaw puzzle that identifies key stages in life's emergence, from the formation of first oceans, tidal sediments, and proto-biofilms to progenotes, proto-cells and the first cellular organisms.

Spitzer argues that non-covalent molecular forces, acting in cycling geochemical processes, bring about phase separations—the creation of purified, lower entropy, potentially living biological matter. Geochemical cycling processes—diurnal solar radiation and tidal hydration-dehydration—underpin life's emergence and evolution. After presenting a physicochemical view of how non-covalent molecular forces stabilize a bacterial cell during its cell cycle, Spitzer assembles the puzzle pieces into a working provisional picture of life's emergence. He classifies early Archaean evolution as micro-evolution, meso-evolution, and macro-evolution according to physicochemical mechanisms that can modify the nucleoid during a prokaryotic cell cycle. Finally, he describes some experimental ideas, based on cyclically driven processes.

Jan Spitzer, a PhD in Physical Chemistry from Queen Elizabeth College at the University of London, has had a long career in chemistry and polymer science, as Associate Professor, and Research and Development Manager in synthetic latex industry. He is the author or coauthor of numerous peer-reviewed papers, technical articles, and book chapters.

February | 6 x 9, 248 pp. | 21 illus.

US $60.00X/$79.00 CAN cloth
978-0-262-04557-5

Vienna Series in Theoretical Biology

Cognitive Choice Modeling

Zheng Joyce Wang and Jerome R. Busemeyer

The emerging interdisciplinary field of cognitive choice models integrates theory and recent research findings from both decision process and choice behavior.

Cognitive decision processes provide the interface between the environment and brain, enabling choice behavior, and the basic cognitive mechanisms underlying decision processes are fundamental to all fields of human activity. Yet cognitive processes and choice processes are often studied separately, whether by decision theorists, consumer researchers, or social scientists. In *Cognitive Choice Modeling*, Zheng Joyce Wang and Jerome Busemeyer introduce a new cognitive modeling approach to the study of human choice behavior. Integrating recent research findings from both cognitive science and choice behavior, they lay the groundwork for the emerging interdisciplinary field of cognitive choice modeling.

The authors focus on individual choice behavior. They begin with a survey of decision science, covering such areas as utility theory, random utility models, and statistical methods for estimating and comparing choice models. They then introduce recent cognitive psychology theories on signal detection and sequential sampling in decision-making. They cover applications of sequential sampling models to both evidence-based and value-based decisions. Their discussion of recent theoretical findings on the integration of learning and choice includes the differences between model-free and model-based learning theories. Having presented the foundational behavioral findings, they move on to the rapid progress being made toward understanding the relations between cognitive choice models and the neural mechanisms underlying choice behavior. Finally, they examine new research directions, including process models based on quantum probability principles.

Zheng Joyce Wang is Professor in the School of Communication at the Ohio State University, where she directs the Communication and Psychophysiology Lab. **Jerome R. Busemeyer** is Distinguished Professor of Psychological and Brain Sciences at Indiana University Bloomington.

March | 6 x 9, 300 pp. | 47 illus.

US $65.00X/$86.00 CAN cloth
978-0-262-04496-7

Classification in the Wild

The Science and Art of Transparent Decision Making

Konstantinos V. Katsikopoulos, Özgür Şimşek, Marcus Buckmann, and Gerd Gigerenzer

Rules for building formal models that use fast-and-frugal heuristics, extending the psychological study of classification to the real world of uncertainty.

This book focuses on classification—allocating objects into categories—"in the wild," in real-world situations and far from the certainty of the lab. In the wild, unlike in typical psychological experiments, the future is not knowable and uncertainty cannot be meaningfully reduced to probability. Connecting the science of heuristics with machine learning, the book shows how to create formal models using classification rules that are simple, fast, and transparent and that can be as accurate as mathematically sophisticated algorithms developed for machine learning.

The authors—whose individual expertise ranges from empirical psychology to mathematical modeling to artificial intelligence and data science—offer real-world examples, including voting, HIV screening, and magistrate decision making; present an accessible guide to inducing the models statistically; compare the performance of such models to machine learning algorithms when applied to problems that include predicting diabetes or bank failure; and discuss conceptual and historical connections to cognitive psychology. Finally, they analyze such challenging safety-related applications as decreasing civilian casualties in checkpoints and regulating investment banks.

Konstantinos V. Katsikopoulos is Associate Professor (Reader) of Behavioural Operations at the Southampton Business School where he is also Head of Research of the Department of Decision Analytics and Risk. **Özgür Şimşek** is Senior Lecturer in Machine Learning in the Department of Computer Science at the University of Bath, where she is also Deputy Director of the Institute for Mathematical Innovation. **Marcus Buckmann** is Senior Data Research Analyst at the Advanced Analytics Division of the Bank of England. **Gerd Gigerenzer** is Director of the Harding Center for Risk Literacy at the Max Planck Institute for Human Development in Berlin and Partner in Simply Rational—The Institute for Decisions.

February | 6 x 9, 200 pp. | 38 illus.

US $35.00X/$47.00 CAN cloth
978-0-262-04515-5

Deliberate Ignorance

Choosing Not to Know

edited by Ralph Hertwig and Christoph Engel

Psychologists, economists, historians, computer scientists, sociologists, philosophers, and legal scholars explore the conscious choice not to seek information.

The history of intellectual thought abounds with claims that knowledge is valued and sought, yet individuals and groups often choose not to know. We call the conscious choice not to seek or use knowledge (or information) deliberate ignorance. When is this a virtue, when is it a vice, and what can be learned from formally modeling the underlying motives? On which normative grounds can it be judged? Which institutional interventions can promote or prevent it? In this book, psychologists, economists, historians, computer scientists, sociologists, philosophers, and legal scholars explore the scope of deliberate ignorance.

Drawing from multiple examples, including the right not to know in genetic testing, collective amnesia in transformational societies, blind orchestral auditions, and "don't ask don't tell" policies, the contributors offer novel insights and outline avenues for future research into this elusive yet fascinating aspect of human nature.

Ralph Hertwig is Director at the Max Planck Institute of Human Development in Berlin and Honorary Professor of Psychology at the Humboldt and Free Universities in Berlin. **Christoph Engel** is Director at the Max Planck Institute for Research on Collective Goods in Bonn, and Professor of Law at the Universities of Bonn and Rotterdam.

"What do people want to know? This is one of the deepest and most fascinating questions in all of social science. Focusing on deliberate ignorance, Hertwig and Engel offer new and fundamental answers to that question. This book is a major step forward."

—Cass R. Sunstein, Robert Walmsley University Professor, Harvard University, and author of *Too Much Information*

February | 6 x 9, 396 pp. | 15 illus.

US $45.00X/$60.00 CAN paper
978-0-262-04559-9

Strüngmann Forum Reports

Variability and Consistency in Early Language Learning

The Wordbank Project

Michael C. Frank, Mika Braginsky, Daniel Yurovsky, and Virginia A. Marchman

A data-driven exploration of children's early language learning across different languages, providing an empirical reference and a new theoretical framework.

This book examines variability and consistency in children's language learning across different languages and cultures, drawing on Wordbank, an open database with data from more than 75,000 children and twenty-nine languages or dialects. This big data approach makes the book the most comprehensive cross-linguistic analysis to date of early language learning. Moreover, its data-driven picture of which aspects of language learning are consistent across languages suggests constraints on the nature of children's language learning mechanisms. The book provides both a theoretical framework for scholars of language learning, language, and human cognition, and a resource for future research.

Wordbank archives data from parents' reports about their children's language learning using instruments in the MacArthur-Bates Communicative Development Inventory (CDI); its goal is to make CDI data available for study and analysis. After an overview of practical and theoretical issues, each of the book's empirical chapters applies a particular analysis to the Wordbank dataset, considering such topics as vocabulary size, demographic variation, syntactic and semantic categories, and the relationship between vocabulary growth and grammar. The final three chapters draw on the preceding chapters to quantify variability and consistency, consider the bird's eye view of language acquisition afforded by the data, and reflect on methodology.

Michael C. Frank is David and Lucile Packard Professor of Human Biology and the Director of the Symbolic Systems Program at Stanford University. **Mika Braginsky** is a PhD candidate in the Department of Brain and Cognitive Science at MIT. **Daniel Yurovsky** is Assistant Professor of Psychology at Carnegie Mellon University. **Virginia A. Marchman** is Research Scientist at Stanford University.

March | 7 x 9, 424 pp. | 175 illus.

US $75.00X/$99.00 CAN cloth
978-0-262-04510-0

Linguistics for the Age of AI

Marjorie McShane and Sergei Nirenburg

A human-inspired, linguistically sophisticated model of language understanding for intelligent agent systems.

One of the original goals of artificial intelligence research was to endow intelligent agents with human-level natural language capabilities. Recent AI research, however, has focused on applying statistical and machine learning approaches to big data rather than attempting to model what people do and how they do it. In this book, Marjorie McShane and Sergei Nirenburg return to the original goal of recreating human-level intelligence in a machine. They present a human-inspired, linguistically sophisticated model of language understanding for intelligent agent systems that emphasizes meaning—the deep, context-sensitive meaning that a person derives from spoken or written language.

With *Linguistics for the Age of AI*, McShane and Nirenburg offer a roadmap for creating language-endowed intelligent agents (LEIAs) that can understand, explain, and learn. They describe the language-understanding capabilities of LEIAs from the perspectives of cognitive modeling and system building, emphasizing "actionability"—which involves achieving interpretations that are sufficiently deep, precise, and confident to support reasoning about action. After detailing their microtheories for topics such as semantic analysis, basic coreference, and situational reasoning, McShane and Nirenburg turn to agent applications developed using those microtheories and evaluations of a LEIA's language understanding capabilities.

McShane and Nirenberg argue that the only way to achieve human-level language understanding by machines is to place linguistics front and center, using statistics and big data as contributing resources. They lay out a long-term research program that addresses linguistics and real-world reasoning together, within a comprehensive cognitive architecture.

Marjorie McShane and **Sergei Nirenburg** are on the faculty of the Cognitive Science Department at Rensselaer Polytechnic Institute.

March | 7 x 9, 464 pp.

US $75.00X/$99.00 CAN cloth
978-0-262-04558-2

The Working Mind

Meaning and Mental Attention in Human Development

Juan Pascual-Leone and Janice M. Johnson

A general organismic-causal theory that explicates working memory and executive function developmentally, clarifying the nature of human intelligence.

In *The Working Mind*, Juan Pascual-Leone and Janice Johnson propose a general organismic-causal theory that explicates working memory and executive function developmentally and by doing so clarifies the nature of human intelligence. Pascual-Leone and Johnson explain "from within" (that is, from a subject's own processing perspective) cognitive developmental stages of growth, describing key causal factors that can account for the emergence of the working mind as a functional totality. Among these factors is a maturationally growing mental attention.

After reviewing meaning-driven processes and constructivist knowledge principles that underlie what Pascual-Leone and Johnson term their Theory of Constructive Operators (TCO), they propose the TCO as as a developmental and neuropsychological approach to human cognitive and affective processes and their development. They present a novel method of mental task analysis that generates from-within process models of subjects' attempts to solve specific tasks. They provide an interpretation of brain semiotic processes that deploys TCO in functionally distinct brain locations. Finally, they show how TCO explicates complex human issues including consciousness, the self, the will, motivation, and individual differences, with applications in education, psychotherapy, and cognitive neuropsychology.

Juan Pascual-Leone is Professor of Psychology Emeritus and Senior Scholar at York University in Toronto. Once a student of Jean Piaget, he is a founder of neo-Piagetian approaches to cognitive development. **Janice M. Johnson** is Associate Professor Emeritus and Senior Scholar at York University. Pascual-Leone and Johnson are Codirectors of the Developmental Processes Laboratory at York University.

April | 7 x 9, 408 pp. | 40 illus.

US $60.00X/$79.00 CAN cloth
978-0-262-04555-1

Knowledge Graphs

Fundamentals, Techniques, and Applications

Mayank Kejriwal, Craig A. Knoblock, and Pedro Szekely

A rigorous and comprehensive textbook covering the major approaches to knowledge graphs, an active and interdisciplinary area within artificial intelligence.

The field of knowledge graphs, which allows us to model, process, and derive insights from complex real-world data, has emerged as an active and interdisciplinary area of artificial intelligence over the last decade, drawing on such fields as natural language processing, data mining, and the semantic web. Current projects involve predicting cyberattacks, recommending products, and even gleaning insights from thousands of papers on COVID-19. This textbook offers rigorous and comprehensive coverage of the field. It focuses systematically on the major approaches, both those that have stood the test of time and the latest deep learning methods.

After presenting introductory and background material, the text covers techniques for constructing knowledge graphs, adding new knowledge to (or refining old knowledge in) knowledge graphs, and accessing (or querying) knowledge graphs. Finally, the book describes specific knowledge graph ecosystems, with each ecosystem corresponding to several real-world applications and case studies. Each chapter concludes with a software and resources section as well as bibliographic notes that suggest required reading. End-of-chapter exercises, 130 in all, represent various levels of abstraction.

Mayank Kejriwal is Research Assistant Professor at the University of Southern California's Viterbi School of Engineering. **Craig A. Knoblock** is Executive Director of the Information Sciences Institute at the University of Southern California, where he is also Research Professor of both Computer Science and Spatial Sciences as well as Director of the Data Science Program. **Pedro Szekely** is Principal Scientist and Director of the Center on Knowledge Graphs at the University of Southern California's Information Sciences Institute.

March | 7 x 9, 568 pp. | 52 illus.

US $55.00X/$73.00 CAN cloth
978-0-262-04509-4

Adaptive Computation and Machine Learning series

Introduction to Quantum Algorithms via Linear Algebra

second edition

Richard J. Lipton and Kenneth W. Regan

The second edition of a textbook that explains quantum computing in terms of elementary linear algebra, requiring no background in physics.

This introduction to quantum algorithms is concise but comprehensive, covering many key algorithms. It is mathematically rigorous but requires minimal background and assumes no knowledge of quantum theory or quantum mechanics. The book explains quantum computation in terms of elementary linear algebra; it assumes the reader will have some familiarity with vectors, matrices, and their basic properties, but offers a review of the relevant material from linear algebra. By emphasizing computation and algorithms rather than physics, it makes quantum algorithms accessible to students and researchers in computer science who have not taken courses in quantum physics or delved into fine details of quantum effects, apparatus, circuits, or theory.

In this second edition, part I, on essential algorithms, provides additional exercises and solved problems. Part II, on advanced algorithms, offers two new chapters: one provides students with a deeper understanding of quantum physics, and includes a discussion of recent experiments claiming "quantum supremacy"; the other new chapter focuses on the Harrow-Hassidim-Lloyd (HHL) algorithm for linear algebra. Additional material touches on some of the philosophical issues involved in quantum mechanics, addressing the divide between quantum and classical. This edition is more versatile than the first edition (published as *Quantum Algorithms via Linear Algebra: A Primer*), with part I suitable for advanced undergraduates and part II, now including notation and tools used by practitioners, suitable for graduate students.

Richard J. Lipton is Frederick G. Story Professor of Computing (Emeritus) at Georgia Institute of Technology. **Kenneth W. Regan** is Associate Professor in the Department of Computer Science and Engineering at University at Buffalo, the State University of New York.

April | 6 x 9, 304 pp. | 20 illus.

US $45.00X/$60.00 CAN cloth
978-0-262-04525-4

Verifying Cyber-Physical Systems

A Path to Safe Autonomy

Sayan Mitra

A graduate-level textbook that presents a unified mathematical framework for modeling and analyzing cyber-physical systems, with a strong focus on verification.

Verification aims to establish whether a system meets a set of requirements. For such cyber-physical systems as driverless cars, autonomous spacecraft, and air-traffic management systems, verification is key to building safe systems with high levels of assurance. This graduate-level textbook presents a unified mathematical framework for modeling and analyzing cyber-physical systems, with a strong focus on verification. It distills the ideas and algorithms that have emerged from more than three decades of research and have led to the creation of industrial-scale modeling and verification techniques for cyber-physical systems.

The book discusses such computer science concepts as undecidability and abstractions, alongside concepts from control theory including multiple Lyapunov functions and barrier certificates, all within a unified mathematical language. It explains algorithms for reachability analysis, counter-example guided abstraction refinement, and data-driven verification, as well as the key data structures that enable their effective implementation. Other topics include invariants, deductive verification, progress analysis, sensitivity analysis, simulation relations, fairness, model checking, satisfiability modulo theories, temporal logics, compositional reasoning, convergence analysis, asynchronous processes, and verification of black-box systems.

The book provides more than twenty examples of cyber-physical verification, ranging from conceptual models to advanced driving-assist systems. Each chapter offers exercise problems; supporting materials, including slides, simulation code, additional exercises, and solutions are available on the book's website.

Sayan Mitra is Professor in the Department of Electrical and Computer Engineering at the University of Illinois at Urbana–Champaign.

February | 7 x 9, 312 pp. | 80 illus.

US $60.00X/$79.00 CAN cloth
978-0-262-04480-6

Cyber Physical Systems series

Information-Driven Planning and Control

Silvia Ferrari and Thomas A. Wettergren

A unified framework for developing planning and control algorithms for active sensing, with examples of applications for modern sensor technologies.

Active sensor systems, increasingly vital to such applications as unmanned vehicles, mobile robots, and environmental monitoring, are characterized by a high degree of autonomy, reconfigurability, and redundancy. This book is the first to offer a unified framework for the development of planning and control algorithms for active sensing with multiple agents, with application examples including cameras and acoustic and gas sensors. The methods presented are characterized as information-driven because their goal is to optimize the value of information, rather than to optimize traditional guidance and navigation objectives.

The book explains relevant background in systems and control, graph, probability, and information theories; develops an integrated mathematical representation, or model, of system components and their interactions; and shows how motion planning, network, and control theoretic algorithms can be used to manage agent mode, position, and motion. It describes information-driven placement, navigation, and control methods that can be used to allocate limited resources so that sensing objectives, including coverage, detection, classification, and tracking, are optimized. These systems are able to process and learn from data, adapt autonomously to unexpected situations, self-organize to meet multiple objectives, and evolve over time to exhibit greater functionality in changing and complex environments. The book's unified notation and treatment allows direct comparison and parallel implementations of methods and algorithms drawn from disparate communities and disciplines.

Silvia Ferrari is John Brancaccio Professor of Mechanical and Aerospace Engineering in the Sibley School of Mechanical and Aerospace Engineering at Cornell University. **Thomas A. Wettergren** is Research Scientist in Applied Mathematics and Adjunct Professor at the University of Rhode Island.

June | 7 x 9, 584 pp. | 164 illus.

US $75.00X/$99.00 CAN cloth
978-0-262-04542-1

Cyber Physical Systems Series

Software Design for Flexibility

How to Avoid Programming Yourself into a Corner

Chris Hanson and Gerald Jay Sussman

Strategies for building systems that can be adapted for new situations with only minor programming modifications.

Time pressures encourage programmers to write code that works well for a narrow purpose, with no room to grow. But the best systems are evolvable; they can be adapted for new situations by adding code, rather than changing the existing code. The authors describe techniques they have found effective—over their combined 100-plus years of programming experience—that will help programmers avoid programming themselves into corners.

The authors explore ways to enhance flexibility by:

- Organizing systems using combinators to compose mix-and-match parts, ranging from small functions to whole arithmetics, with standardized interfaces
- Augmenting data with independent annotation layers, such as units of measurement or provenance
- Combining independent pieces of partial information using unification or propagation
- Separating control structure from problem domain with domain models, rule systems and pattern matching, propagation, and dependency-directed backtracking
- Extending the programming language, using dynamically extensible evaluators

Some of the techniques, such as dynamically extensible generic procedures, are extremely powerful but potentially dangerous. Each chapter includes exercises. Code is written in Scheme, a simple dialect of Lisp. Examples range from astronomy to automatic differentiation to an adventure game.

Chris Hanson is on the technical staff at Datera. He was at MIT for many years, where he was the principal author of the MIT/GNU Scheme system. He also spent ten years at Google. **Gerald Jay Sussman** is Panasonic Professor of Electrical Engineering at MIT. He is the coauthor of *Structure and Interpretation of Computer Programs*, *Structure and Interpretation of Classical Mechanics*, and *Functional Differential Geometry* (all published by the MIT Press).

March | 6 x 9, 448 pp.

US $55.00X/$73.00 CAN cloth
978-0-262-04549-0

How Humans Judge Machines

César A. Hidalgo, Diana Orghian, Jordi Albo-Canals, Filipa de Almeida, and Natalia Martin

How people judge humans and machines differently, in scenarios involving natural disasters, labor displacement, policing, privacy, algorithmic bias, and more.

How would you feel about losing your job to a machine? How about a tsunami alert system that fails? Would you react differently to acts of discrimination depending on whether they were carried out by a machine or by a human? What about public surveillance?

How Humans Judge Machines compares people's reactions to actions performed by humans and machines. Using data collected in dozens of experiments, this book reveals the biases that permeate human–machine interactions.

Are there conditions in which we judge machines unfairly? Is our judgment of machines affected by the moral dimensions of a scenario? Is our judgment of machine correlated with demographic factors such as education or gender?

César Hidalgo and colleagues use hard science to take on these pressing technological questions. Using randomized experiments, they create revealing counterfactuals and build statistical models to explain how people judge artificial intelligence and whether they do it fairly. Through original research, *How Humans Judge Machines* bring us one step closer tounderstanding the ethical consequences of AI.

Written by **César A. Hidalgo**, the author of *Why Information Grows* and coauthor of *The Atlas of Economic Complexity* (MIT Press), together with a team of social psychologists (**Diana Orghian** and **Filipa de Almeida**) and roboticists (**Jordi Albo-Canals**), *How Humans Judge Machines* presents a unique perspective on the nexus between AI and society. Anyone interested in the future of AI ethics should explore the experiments and theories in *How Humans Judge Machines*.

February | 7 x 9, 224 pp. | 32 illus.

US $35.00X/$47.00 CAN cloth
978-0-262-04552-0

computer science

Introduction to Computation and Programming Using Python

With Application to Computational Modeling

third edition

John V. Guttag

The new edition of an introduction to the art of computational problem solving using Python.

This book introduces students with little or no prior programming experience to the art of computational problem solving using Python and various Python libraries, including numpy, matplotlib, random, pandas, and sklearn. It provides students with skills that will enable them to make productive use of computational techniques, including some of the tools and techniques of data science for using computation to model and interpret data as well as substantial material on machine learning.

The book is based on an MIT course and was developed for use not only in a conventional classroom but in a massive open online course (MOOC). It contains material suitable for a two-semester introductory computer science sequence.

This third edition has expanded the initial explanatory material, making it a gentler introduction to programming for the beginner, with more programming examples and many more "finger exercises." A new chapter shows how to use the pandas package for analyzing time series data. All the code has been rewritten to make it stylistically consistent with the PEP 8 standards. Although it covers such traditional topics as computational complexity and simple algorithms, the book focuses on a wide range of topics not found in most introductory texts, including information visualization, simulations to model randomness, computational techniques to understand data, and statistical techniques that inform (and misinform) as well as two related but relatively advanced topics: optimization problems and dynamic programming. The book also includes a Python 3 quick reference guide.

John V. Guttag is Dugald C. Jackson Professor of Computer Science and Electrical Engineering at MIT.

March | 7 x 9, 664 pp. | 140 illus.

US $55.00X/$73.00 CAN paper
978-0-262-54236-4

Victor Papanek

Designer for the Real World

Alison J. Clarke

The history and controversial roots of the social design movement, explored through the life and work of its leading pioneer, Victor Papanek.

In *Victor Papanek: Designer for the Real World*, Alison Clarke explores the social design movement through the life of its leading pioneer, the Austrian American designer, theorist, and activist Victor Papanek. Papanek's 1971 best seller, *Design for the Real World: Human Ecology and Social Change* has been translated into 22 languages and never fallen out of print. Its politics of social design, anti-corporatism, and environmental sustainability have found renewed pertinence in the twenty-first century and dominate the agendas of design schools today. Drawing extensively on previously unexplored archival sources, Clarke uncovers and contextualizes the movement's controversial origins and contradictions.

Within the fields of design and environmental studies, Papanek is celebrated as a guru of alternative economics and progressive design. Yet Clarke overturns the notion that socially responsible and sustainable design emerged from the counterculture and alternative politics of the late 1960s and 1970s. Instead, she exposes its roots in the late Cold War technocratic culture and policies of US military and development interventionism. She examines the shift away from industrial design as an expression of industrial rationalism toward flawed attempts at humanitarian intervention through quasi-anthropological approaches and design strategies aimed at the socially and culturally excluded. She also casts a critical light on the current social design movement by revealing the macropolitics and neocolonial history in which it is embedded.

Alison J. Clarke is a design historian and social anthropologist. She is Professor of Design History and Theory at the University of Applied Arts Vienna, where she is also Director of the Victor J. Papanek Foundation.

March | 7 x 9, 344 pp. | 78 color illus.

US $40.00X/$54.00 CAN cloth
978-0-262-04494-3

Beyond the Creative Species

Making Machines That Make Art and Music

Oliver Bown

A multidisciplinary introduction to the field of computational creativity, analyzing the impact of advanced generative technologies on art and music.

As algorithms get smarter, what role will computers play in the creation of music, art and other cultural artifacts? Will they be able to create such things from the ground up, and will such creations be meaningful? In *Beyond the Creative Species*, Oliver Bown offers a multidisciplinary examination of computational creativity, analyzing the impact of advanced generative technologies on art and music. Drawing on a wide range of disciplines, including artificial intelligence and machine learning, design, social theory, the psychology of creativity, and creative practice research, Bown argues that to understand computational creativity, we must not only consider what computationally creative algorithms actually do, but also examine creative artistic activity itself.

After describing the state of the art in computational creativity—including past and present cycles of hype—Bown examines the psychology of creativity and how it may be amenable to algorithmic automation. He considers human creativity as a social phenomenon that depends on such factors as position within a social network and group identity. He reviews the existing algorithms for the production of computer-generated content, examines issues of interaction design, and explores paradigms of computational creativity; considers the evaluation of computationally creative systems, addressing the difference between the analysis of systems as creative agents and as creativity support tools; and, looking to the future, discusses the social implications of the consumption and experience of generated art and music.

Oliver Bown is Senior Lecturer and Researcher in the Interactive Media Lab at the University of New South Wales.

February | 6 x 9, 424 pp. | 17 illus.

US $45.00X/$60.00 CAN cloth
978-0-262-04501-8

Code as Creative Medium

A Handbook for Computational Art and Design

Golan Levin and Tega Brain

An essential guide for teaching and learning computational art and design: exercises, assignments, interviews, and more than 170 illustrations of creative work.

This book is an essential resource for art educators and practitioners who want to explore code as a creative medium, and serves as a guide for computer scientists transitioning from STEM to STEAM in their syllabi or practice. It provides a collection of classic creative coding prompts and assignments, accompanied by annotated examples of both classic and contemporary projects, and more than 170 illustrations of creative work, and features a set of interviews with leading educators. Picking up where standard programming guides leave off, the authors highlight alternative programming pedagogies suitable for the art- and design-oriented classroom, including teaching approaches, resources, and community support structures.

The book first offers a collection of syllabus modules, each built around an open-ended assignment or prompt, and all tested, adapted, or observed by the authors over twenty years of practice and teaching. Examples have been selected for their explicability and for their representation of varied approaches. The book then presents brief programming exercises relevant to artists and designers, helping readers learn computational techniques to control elementary visual (or in some cases, auditory or textual) patterns and forms. Finally, a diverse group of educators—including Dan Shiffman, Lauren McCarthy, and Taeyoon Choi—discuss the challenges of teaching expressive and critical studio arts through the tools of software development.

Golan Levin is Professor of Electronic Art at Carnegie Mellon University, where he is also Director of the Frank-Ratchye STUDIO for Creative Inquiry. **Tega Brain**, an Australian-born artist, educator, and researcher, is Assistant Professor of Integrated Digital Media at New York University.

"I am struck by Levin and Brain's use of 'make it meaningful,' highlighting the critical core of this timely book—it links deeply the why to the how of teaching and learning creative coding."
—Chris Coleman, Professor of Emergent Digital Practices at the University of Denver and Director of the Clinic for Open Source Arts (COSA)

February | 9 x 7, 284 pp. | 171 illus.

US $35.00X/$47.00 CAN paper
978-0-262-54204-3

Public Opinion and the Political Economy of Education Policy around the World

edited by Martin R. West and Ludger Woessmann

Comparative analyses of public opinion on education policy in developed countries.

Although research has suggested a variety of changes to education policy that have the potential to improve educational outcomes, politicians are often reluctant to implement such evidence-based reforms. Public opinion and pressure by interest groups would seem to have a greater role in shaping education policy than insights drawn from empirical data. The construction of a comparative political economy of education that seeks to explain policy differences among nations is long overdue. This book offers the first comparative inventory and analysis of public opinion on education in developed countries, drawing on data primarily from Europe and the United States.

Contributors first compare public attitudes about such policy topics as education spending and the status of teachers across many countries, with a particular emphasis on the two largest industrialized nations in the Western world, the United States and Germany. The book then offers case studies of education policies and reforms in specific settings. Chapters examine issues including partisan and ideological conflict over government spending on schools in the United States; the effect of information provision on German public opinion on education; and demographic differences and education policy preferences in Switzerland.

Martin R. West is William Henry Bloomberg Professor of Education at Harvard University. **Ludger Woessmann** is Professor of Economics at the University of Munich and Director of the Ifo Center for the Economics of Education.

Contributors
Samuel Barrows, Marius R. Busemeyer, Maria A. Cattaneo, Peter Dolton, Julian L. Garritzmann, Michael B. Henderson, Anja Kilibarda, Philipp Lergetporer, Oliver McClellan, Paul E. Peterson, Robert Y. Shapiro, Sofi Sinozich, Katharina Werner, Martin R. West, Ludger Woessmann, Stefan C. Wolter

April | 6 x 9, 328 pp. | 63 illus.

US $50.00X/$66.00 CAN cloth
978-0-262-04568-1

CESifo Seminar series

Voicing Code in STEM

A Dialogical Imagination

Pratim Sengupta, Amanda Dickes, and Amy Voss Farris

An exploration of coding that investigates the interplay between computational abstractions and the fundamentally interpretive nature of human experience.

The importance of coding in K–12 classrooms has been taken up by both scholars and educators. *Voicing Code in STEM* offers a new way to think about coding in the classroom—one that goes beyond device-level engagement to consider the interplay between computational abstractions and the fundamentally interpretive nature of human experience. Building on Mikhail Bakhtin's notions of heterogeneity and heteroglossia, the authors explain how STEM coding can be understood as voicing computational utterances, rather than a technocentric framing of building computational artifacts. Empirical chapters illustrate this theoretical stance by investigating different framings of coding as voicing.

Understanding the experiential nature of coding allows us to design better tools and curricula for students, and enables us to see computing as experience beyond the mastery of symbolic power. Arguing for a critical phenomenology of coding, the authors explain that the phenomenological dimension refocuses attention on the fundamentally complex nature of human experiences that are involved in coding and learning to code. The critical dimension involves learning to recognize voices that historically have received less attention.

Pratim Sengupta is Full Professor of Learning Sciences and Research Chair in STEM Education in the Werklund School of Education at the University of Calgary. **Amanda Dickes** is a Learning Scientist at the Gulf of Maine Research Institute. **Amy Voss Farris** is Assistant Professor in the College of Education at Penn State University.

March | 6 x 9, 232 pp.

US $28.00X/$37.00 CAN paper
978-0-262-04511-7

Effective Advocacy

Lessons from East Asia's Environmentalists

Mary Alice Haddad

An examination of successful environmental advocacy strategies in East Asia that shows how advocacy can be effective under difficult conditions.

The countries of East Asia—China, Japan, South Korea, and Taiwan—are home to some of the most active and effective environmental advocates in the world. And the governments of these countries have adopted a range of innovative policies to fight pollution and climate change: Japan leads the world in emissions standards, China has become the world's largest producer of photovoltaic panels, and Taiwan and South Korea have undertaken major green initiatives. In this book, Mary Alice Haddad examines the advocacy strategies that persuaded citizens, governments, and businesses of these countries to change their behavior.

How did environmental activists succeed in countries that favor business interests and are generally hostile to citizen-based advocacy? Haddad identifies and describes, with examples, five of the most effective advocacy strategies used by environmentalists in East Asia: cultivate policy access, make it work locally, make it work for business, engage the heart, and think outside the box. Drawing on both qualitative and quantitative data, she develops the Connected Stakeholder Model to show how advocates work through personal and professional networks to influence people in power. Stakeholders involved in policymaking are connected to diverse and multiple networks, which help them to develop complex ideas about the policies they develop. East Asia's effective advocacy strategies, as well as Haddad's theoretical framework, offer valuable lessons for activists, policy makers, and researchers.

Mary Alice Haddad is John E. Andrus Professor of Government and Professor of East Asian and Environmental Studies at Wesleyan University. She is the author of *Building Democracy in Japan* and *Politics and Volunteering in Japan: A Global Perspective*.

March | 6 x 9, 320 pp. | 16 illus.

US $35.00X/$47.00 CAN paper
978-0-262-54235-7

American and Comparative Environmental Policy series

Resigned Activism

Living with Pollution in Rural China

Anna Lora-Wainwright

revised edition

An examination of the daily grind of living with pollution in rural China and of the varying forms of activism that develop in response.

Residents of rapidly industrializing rural areas in China live with pollution every day. Villagers drink obviously tainted water and breathe visibly dirty air, afflicted by a variety of ailments—from arthritis to nosebleeds—that they ascribe to the effects of industrial pollution. In *Resigned Activism*, Anna Lora-Wainwright explores the daily grind of living with pollution in rural China and the varying forms of activism that develop in response. This revised edition offers expanded acknowledgment of the contributions of Lora-Wainwright's collaborators in China.

Lora-Wainwright finds that claims of health or environmental damage are politically sensitive, and that efforts to seek redress are frustrated by limited access to scientific evidence, growing socioeconomic inequalities, and complex local realities. Villagers, feeling powerless, often come to accept pollution as part of the environment; their activism is tempered by their resignation. Drawing on fieldwork done with teams of collaborators, Lora-Wainwright offers three case studies of "resigned activism" in rural China, examining the experiences of villagers who live with the effects of phosphorous mining and fertilizer production, lead and zinc mining, and electronic waste processing. The book also includes extended summaries of the in-depth research carried out by Ajiang Chen and his team in some of China's "cancer villages," village-sized clusters of high cancer incidence. These cases make clear the staggering human costs of development and the deeply uneven distribution of costs and benefits that underlie China's economic power.

Anna Lora-Wainwright is Professor of the Human Geography of China at the University of Oxford, and the author of *Fighting for Breath: Living Morally and Dying of Cancer in a Chinese Village*.

March | 6 x 9, 288 pp. | 27 illus.

US $30.00X/$40.00 CAN paper
978-0-262-54249-4

Urban and Industrial Environments series

Against Flow

Video Games and the Flowing Subject

Braxton Soderman

A critical discussion of the experience and theory of flow (as conceptualized by Mihaly Csikszentmihalyi) in video games.

Flow—as conceptualized by the psychologist Mihaly Csikszentmihalyi—describes an experience of "being in the zone," of intense absorption in an activity. It is a central concept in the study of video games, although often applied uncritically. In *Against Flow*, Braxton Soderman takes a step back and offers a critical assessment of flow's historical, theoretical, political, and ideological contexts in relation to video games. With close readings of games that implement and represent flow, Soderman not only evaluates the concept of flow in terms of video games but also presents a general critique of flow and its sibling, play.

Soderman argues that flow is a game design strategy used to extend the duration of playful consumption. Players—called flowing subjects by Soderman—are not simply experiencing the psychological state of flow; they are being positioned as media consumers in ways that promote flow's ideologies and sustain ludic capitalism. He examines flow from a range of perspectives, considering, among other things, flow as a form of coping with alienation, the commodification of flow, and the relationship of flow and reflection. Finally, Soderman calls for the design and interpretation of new architectures of critical flow in games, arguing that we must rethink standard forms of flow and embrace more diverse and inclusive forms of the flowing subject.

Braxton Soderman is Assistant Professor of Film and Media Studies in the School of Humanities at the University of California, Irvine.

April | 6 x 9, 328 pp. | 34 illus.

US $40.00X/$54.00 CAN cloth
978-0-262-04550-6

Knowledge Justice

Disrupting Library and Information Studies through Critical Race Theory

edited by Sofia Y. Leung and Jorge R. López-McKnight

Black, Indigenous, and Peoples of Color reimagine library and information science through the lens of critical race theory.

In *Knowledge Justice*, Black, Indigenous, and Peoples of Color scholars use critical race theory (CRT) to challenge the foundational principles, values, and assumptions of Library and Information Science and Studies (LIS) in the United States. They propel CRT to center stage in LIS, to push the profession to understand and reckon with how white supremacy affects practices, services, curriculum, spaces, and policies.

The contributors show that the field is deeply invested in the false idea of its own objectivity and neutrality, and they go on to show how this relates to assumptions about race. Through deep analyses of library and archival collections, scholarly communication, hierarchies of power, epistemic supremacy, children's librarianship, teaching and learning, digital humanities, and the education system, *Knowledge Justice* challenges LIS to reimagine itself by throwing off the weight and legacy of white supremacy and reaching for racial justice.

Sofia Y. Leung (she/her) is a librarian, facilitator, and educator in the Boston area. **Jorge R. López-McKnight** (he/him) is a community college library worker in Austin, Texas.

Contributors

Miranda H. Belarde-Lewis (Zuni and Tlingit), Jennifer Brown, Anastasia Chiu, Nicholae Cline (Coharie), Anne Cong-Huyen, Tony Dunbar, Isabel Espinal, Fobazi M. Ettarh, Jennifer A. Ferretti, April M. Hathcock, Todd Honma, Harrison W. Inefuku, Sarah R. Kostelecky (Zuni Pueblo), Kafi Kumasi, Sofia Y. Leung, Jorge R. López-McKnight, Sujei Lugo, Marisa Méndez-Brady, Myrna Morales, Lalitha Nataraj, Vani Natarajan, Antonia P. Olivas, Kush Patel, Torie Quiñonez, Maria Adoria Rios, Tonia Sutherland, Shaundra Walker, Stacie Williams, Rachel E. Winston

April | 7 x 9, 320 pp. | 4 illus.

US $35.00X/$47.00 CAN paper
978-0-262-04350-2

Merge

Binarity in (Multidominant) Syntax

Barbara Citko and Martina Gračanin-Yüksek

An argument that Merge is binary but its binarity refers to syntactic positions rather than objects.

In this book, Barbara Citko and Martina Gračanin-Yüksek examine the constraints on Merge—the basic structure-building operation in minimalist syntax—from a multidominant perspective. They maintain that Merge is binary, but argue that the binarity of Merge refers to syntactic positions Merge relates: what has typically been formulated as a constraint that prevents Merge from combining more than two syntactic objects is a constraint on Merge's relating more than two syntactic positions.

Citko and Gračanin-Yüksek investigate the interactions between the two types of Merge that can generate multidominant structures: Parallel Merge and Internal Merge. Taking Right Node Raiding (RNR) as a representative example of Parallel Merge and Across-the-Board (ATB) extraction to be representative of Parallel Merge + Internal Merge, they show that ATB is subject to a parallelism constraint that RNR is not subject to. They show that this difference follows from Binarity Constraint on Merge (BiCoM), the requirement that prevents Merge from relating more than two syntactic positions within a single derivation, which is obeyed in RNR, but not in ATB extraction. They further show that BiCoM is also operative in languages with more flexible word order, such as Croatian and Polish, and that structural syncretism alleviates BiCoM violations in these languages as well.

Barbara Citko is Professor of Linguistics at the University of Washington. She is the author of *Phase Theory: An Introduction* and *Symmetry in Syntax: Merge, Move and Labels*. **Martina Gračanin-Yüksek** is Professor in the Department of Foreign Language Education at Middle East Technical University in Ankara, Turkey.

February | 6 x 9, 190 pp. | 107 illus.

US $35.00X/$47.00 CAN paper
978-0-262-53986-9

US $85.00X/$112.00 CAN cloth
978-0-262-04479-0

Linguistic Inquiry Monographs series

The Next Age of Disruption

MIT Sloan Management Review

Management experts discuss the innovation challenges that lie ahead, building on Clayton Christensen's famous theory of "disruptive innovation."

Clayton Christensen's groundbreaking theory of "disruptive innovation" has proven to be one of the most influential management ideas of the last several decades. In this book, business and management experts—many of them Christensen's colleagues and former students—discuss the innovation challenges that lie ahead. Building on Christensen's work, they offer companies a guide for navigating a new world of disruption—a future in which artificial intelligence is a business tool, the speed of innovation increases dramatically, and capital is more easily accessible. The book also includes one of the last interviews with Christensen before his death in January 2020.

The contributors first consider "the human element," discussing such topics as why good ideas get stuck and how innovators can allay skittish potential supporters' concerns, ethical issues in an age of disruption, and how to retain top talent. Turning to issues of competition, they examine the nearly frictionless shopping experience offered by such new disrupters as Warby Parker and Dollar Shave Club, discuss AI as a game-changer, and explore the power of platforms. Finally, they consider the future, listing eleven sources of disruption every company should monitor, explaining how to anticipate uncertainty, and describing the benefits of both internal and external partnerships.

Contributors

Scott D. Anthony, Didier Bonnet, Greg Brown, Clayton M. Christensen, Michael A. Cusumano, Karen Dillon, Jeff Dyer, Sebastian K. Fixson, Nathan Furr, Joshua Gans, Annabelle Gawer, Brian Halligan, Nicole Helmer, Mike Hendron, Michael B. Horn, Marco Iansiti, Rahul Kapoor, Thomas Klueter, Karim R. Lakhani, Tucker J. Marion, Rita Gunther McGrath, Michael Putz, Neil C. Thompson, Amy Webb, Max Wessel, Ardine Williams, Yun Ye, David B. Yoffie

February | 5 3/8 x 8, 288 pp. | 4 illus.

US $25.00X/$34.00 CAN paper
978-0-262-54221-0

The Digital Future of Management

Lectures on the Philosophy of Mathematics

Joel David Hamkins

An introduction to the philosophy of mathematics grounded in mathematics and motivated by mathematical inquiry and practice.

In this book, Joel David Hamkins offers an introduction to the philosophy of mathematics that is grounded in mathematics and motivated by mathematical inquiry and practice. He treats philosophical issues as they arise organically in mathematics, discussing such topics as platonism, realism, logicism, structuralism, formalism, infinity, and intuitionism in mathematical contexts. He organizes the book by mathematical themes—numbers, rigor, geometry, proof, computability, incompleteness, and set theory—that give rise again and again to philosophical considerations.

Hamkins shows, for example, how number systems set the stage for discussions of such philosophical issues as platonism, logicism, and the nature of abstraction. Consideration of the rise of rigor in the calculus leads to a discussion of whether the indispensability of mathematics in science offers grounds for mathematical truth. Sophisticated technical developments in set theory give rise to a necessary engagement with deep philosophical concerns, including the criteria for new mathematical axioms. Throughout, Hamkins offers a clear and engaging exposition that is both accessible and sophisticated, intended for readers whose mathematical backgrounds range from novice to expert.

Joel David Hamkins is Professor of Logic at Oxford University and Sir Peter Strawson Fellow in Philosophy at University College, Oxford. The author of *Proof and the Art of Mathematics* (MIT Press), he is the creator of the popular blog *Mathematics and Philosophy of the Infinite*. He is a prominent contributor to MathOverflow, where he has posted more than 1,000 mathematical arguments.

"An engaging introduction to philosophical issues that arise within mathematics, explained with mathematical examples that don't require much background to understand. Hamkins is a prominent set-theorist with a strong philosophical bent, and an exceptionally good expositor. The book is extremely readable, and has insightful discussions of a wide variety of topics. I recommend it highly."
—Hartry Field, Silver Professor of Philosophy, New York University

February | 7 x 9, 352 pp.

US $45.00X/$60.00 CAN paper
978-0-262-54223-4

mathematics

Proof and the Art of Mathematics

Examples and Extensions

Joel David Hamkins

How to write mathematical proofs, shown in fully worked-out examples.

This companion volume to Joel Hamkins's *Proof and the Art of Mathematics* provides fully worked-out solutions to all of the odd-numbered exercises as well as a few of the even-numbered exercises. In many cases, the solutions go beyond the exercise question itself to the natural extensions of the ideas, helping readers learn how to approach a mathematical investigation. As Hamkins asks, "Once you have solved a problem, why not push the ideas harder to see what further you can prove with them?" These solutions offer readers examples of how to write a mathematical proofs.

The mathematical development of this text follows the main book, with the same chapter topics in the same order, and all theorem and exercise numbers in this text refer to the corresponding statements of the main text.

Joel David Hamkins is Professor of Logic at Oxford University and Sir Peter Strawson Fellow in Philosophy at University College, Oxford. He has published widely in refereed research journals in mathematical logic and set theory and is the creator of the popular blog *Mathematics and Philosophy of the Infinite*. He is a prominent contributor to MathOverflow, where he has posted more than 1,000 mathematical arguments.

February | 7 x 9, 132 pp. | 47 illus.

US $30.00X/$40.00 CAN paper
978-0-262-54220-3

The 360° Gaze

Immersions in Media, Society, and Culture

Christian Stiegler

A comprehensive study of the pervasive role of immersion and immersive media in postmodern culture, from a humanities and social sciences perspective.

Virtual reality, augmented reality, mixed reality, and other modes of digitally induced immersion herald a major cultural and economic shift in society. Most academic discussions of immersion and immersive media have focused on the technological aspects. In *The 360° Gaze*, Christian Stiegler takes a humanities and social science approach, emphasizing the human implications of immersive media in postmodern culture. Examining characteristics common to all immersive experiences, he uncovers dominant metaphors, such as the rabbit hole, and prevailing ideologies. He raises fundamental questions about opportunities and risks associated with immersion, as well as the potential effects on individuals, communities, and societies.

Stiegler expands the range of media practices we should consider immersive. Introducing his theoretical framework of "the 360° gaze," he navigates immersive experiences in literature, film, television, the performing arts, digital games, and immersive technologies. He considers their implications for psychology and reception, as well as their role in cultural industries and digital ecosystems. As he examines the intersections among immersive settings in media and in everyday immersive acts, he reframes such topics as mediation of the self, binge-watching, fandom, extended reality, and artificial intelligence. Immersion, he argues, is key to understanding the role of mass media in postmodern society. Stiegler perceives immersion to be an even more powerful and enduring form of engagement than mediation. Writing as a researcher and storyteller, he provides a guide to rethinking immersion in mediated experiences from the past, to enable us to prepare ourselves for the future.

Christian Stiegler is an Associate Professor of Immersive Media at the University of the West of England, Bristol.

May | 6 x 9, 312 pp. | 25 illus.

US $45.00X/$60.00 CAN cloth
978-0-262-04566-7

Email and the Everyday

Stories of Disclosure, Trust, and Digital Labor

Esther Milne

An exploration of how email is experienced, understood, and materially structured as a practice spanning our everyday domestic and work lives.

Despite its many obituaries, email is not dead. As a global mode of business and personal communication, email outstrips newer technologies of online interaction; it is deeply embedded in our everyday lives. And yet—perhaps because the ubiquity of email has obscured its study—this is the first scholarly book devoted to email as a key historical, social, and commercial site of digital communication in our everyday lives. In *Email and the Everyday*, Esther Milne examines how email is experienced, understood, and materially structured as a practice spanning the domestic and institutional spaces of daily life.

Email experiences range from the routine and banal to the surprising and shocking. Drawing on interviews and online surveys, Milne focuses on both the material and the symbolic properties of email. She maps the development of email as a technology and an industry; considers institutional uses of email, including "bureaucratic intensity" of workplace email and the continuing vibrancy of email groups; and examines what happens when private emails end up in public archives, discussing the Enron email dataset and Hillary Clinton's infamous private server. Finally, Milne explores the creative possibilities of email, connecting eighteenth-century epistolary novels to contemporary "email novels," discussing the vernacular expression of ASCII art and mail art, and examining email works by Carl Steadman, Miranda July, and others.

Esther Milne is Associate Professor of Media and Communications at Swinburne University of Technology in Melbourne, Australia.

"Esther Milne has written a compelling book about our understanding of and experiences with and through email. She maneuvers effortlessly between the everyday banalities and the extraordinary drama that transpire in emails, and masterfully delivers finely grained analyses of email stories while displaying a deep consideration of wider social and political currents. Both inspiring and fascinating."
—Anette Grønning, Associate Professor, Department for the Study of Culture, University of Southern Denmark

February | 6 x 9, 336 pp. | 2 illus.

US $35.00X/$47.00 CAN cloth
978-0-262-04563-6

Uncertain Archives

Critical Keywords for Big Data

edited by Nanna Bonde Thylstrup, Daniela Agostinho, Annie Ring, Catherine D'Ignazio, and Kristin Veel

Scholars from a range of disciplines interrogate terms relevant to critical studies of big data, from abuse and aggregate to visualization and vulnerability.

This groundbreaking work offers an interdisciplinary perspective on big data and the archives they accrue, interrogating key terms. Scholars from a range of disciplines analyze concepts relevant to critical studies of big data, arranged glossary style—from abuse and aggregate to visualization and vulnerability. They not only challenge conventional usage of such familiar terms as prediction and objectivity but also introduce such unfamiliar ones as overfitting and copynorm. The contributors include a broad range of leading and agenda-setting scholars, including as N. Katherine Hayles, Wendy Hui Kyong Chun, Johanna Drucker, Lisa Gitelman, Safiya Noble, Sarah T. Roberts, and Nicole Starosielski.

Uncertainty is inherent to archival practices; the archive as a site of knowledge is fraught with unknowns, errors, and vulnerabilities that are present, and perhaps even amplified, in big data regimes. Bringing lessons from the study of the archive to bear on big data, the contributors consider the broader implications of big data's large-scale determination of knowledge.

Nanna Bonde Thylstrup is Associate Professor at Copenhagen Business School and author of *The Politics of Mass Digitization* (MIT Press). **Daniela Agostinho** is postdoctoral fellow in the Department of Arts and Cultural Studies at the University of Copenhagen. **Annie Ring** is Lecturer in the Faculty of Arts & Humanities at University College London. **Catherine D'Ignazio** is Assistant Professor of Urban Science and Planning at MIT and coauthor of *Data Feminism* (MIT Press). **Kristin Veel** is Associate Professor at the Department for Arts and Cultural Studies at the University of Copenhagen and coauthor of *Tower to Tower* (MIT Press).

February | 7 x 9, 640 pp. | 44 illus.

US $55.00X/$73.00 CAN paper
978-0-262-53988-3

media | cultural studies

Exploratory Programming for the Arts and Humanities

second edition

Nick Montfort

A new edition of a book for anyone who wants to learn programming to explore and create, with exercises and projects to help readers learn by doing.

This book introduces programming to readers involved with the arts and humanities; there are no prerequisites, and no previous knowledge of programming is assumed. Nick Montfort reveals programming to be not merely a technical exercise within given constraints but a tool for sketching, brainstorming, and inquiry. He emphasizes programming's exploratory potential—its facility to create new kinds of artworks and to probe data for new ideas. The book is designed to be read alongside the computer, allowing readers to program while making their way through the chapters. It offers practical exercises in writing and modifying code and outlines "free projects" that allow learners to pursue their own interests.

This second edition has been reorganized and expanded to allow more modular use while also offering a better experience for readers who wish to go through all the chapters. It provides many more exercises, especially early on, to help learners build a foundation of basic knowledge, and it offers new free projects. A new chapter on classification allows learners to understand machine learning through programming and across different types of media. This edition also includes new illustrations that support an understanding of essential concepts in programming as well as a significantly expanded glossary. The book uses Python and Processing, and has been updated from Python 2 to Python 3.

Nick Montfort is Professor of Digital Media at MIT. He is the author of T*wisty Little Passages* and *The Future* (both published by the MIT Press).

May | 7 x 9, 328 pp. | 10 illus.

US $40.00X/$54.00 CAN cloth
978-0-262-04460-8

The Politics of Dating Apps

Gender, Sexuality, and Emergent Publics in Urban China

Lik Sam Chan

An examination of dating app culture in China, across user demographics—straight women, straight men, queer women, and queer men.

In this exploration of dating app culture in China, Lik Sam Chan argues that these popular mobile apps are not merely a platform for personal relationships but also an emerging arena for gender and queer politics. Chan examines the opportunities dating apps present for women's empowerment and men's performances of masculinity, and he links experiences of queer dating app users with their vulnerable position as sexual minorities. He finds that dating apps are both portals to an exciting virtual world of relational possibilities and sites of power dynamics that reflect the heteronormativity and patriarchy of Chinese society.

Drawing on in-depth interviews with urban users of such dating apps as Momo, Tantan, Blued, Aloha, Rela, and Lesdo, Chan proposes "networked sexual publics" as a unifying concept to capture the dynamics of dating app culture. Devoting a chapter to each of four publics—straight women, straight men, queer men, and queer women—Chan documents how relationships are shaped and transfigured by this emerging technology. He considers whether dating apps can be a feminist tool; explores straight men's self-presentation on the apps and their interactions with women they meet there; discusses the constant cycle of deleting and installing the same apps seen among queer men; and examines how popular lesbian dating apps may connect queer women to their communities. Finally, Chan maps possible paths for future intersectional, queer, and feminist scholarship on emerging communication technologies.

Lik Sam Chan is Assistant Professor in the School of Journalism and Communication at the Chinese University of Hong Kong.

March | 6 x 9, 184 pp. | 10 illus.

US $30.00X/$40.00 CAN paper
978-0-262-54234-0

Information Society series

Intrusive Thinking

From Molecules to Free Will

edited by Peter W. Kalivas and Martin P. Paulus

An exploration of the neurological and behavioral mechanisms and processes involved in intrusive thinking.

On any given day, unintended, recurrent thoughts intrude on our thinking and affect our behavior in ways that can be adaptive. Such thoughts, however, become intrusive and problematic when they are unwanted, become compulsive, or lead to socially or medically unacceptable behavior. This volume explores what goes on in our brains to create thought intrusions, and how these intrusions lead to maladaptive behavior.

Intrusive thoughts feature prominently in most psychiatric disorders, so understanding the neurological and behavioral processes underlying them is an urgent endeavor. To investigate these issues, contributors from a range of disciplines—including neuroscience, psychiatry, psychology, and pharmacology—consider the mechanisms involved in intrusive thoughts under normal and abnormal conditions. They analyze how decision making becomes corrupted to create uncontrollable intrusions, explore the implications for concepts of free will and individual responsibility, and suggest avenues for future research.

Peter W. Kalivas is Professor of Neuroscience at the Medical University of South Carolina in Charleston. **Martin P. Paulus** is Scientific Director and President of the Laureate Institute for Brain Research and Adjunct Professor in the Department of Psychiatry at the University of California, San Diego.

"This wonderful book provides a comprehensive consideration of the very human experience of intrusive thinking. How such thoughts arise and their influence on behavior is covered by carefully crafted chapters from world-leading scientists. From cells to circuits, psychology to therapeutics, this is the definitive book on intrusive thinking."
—Paul J. Kenny, Ward-Coleman Professor and Chair, Nash Family Department of Neuroscience, Mount Sinai School of Medicine, NY

February | 6 x 9, 474 pp. | 20 color illus., 20 b&w illus.

US $45.00X/$60.00 CAN paper
978-0-262-54237-1

Strüngmann Forum Reports

Defining Mental Disorder

Jerome Wakefield and His Critics

edited by Luc Faucher and Denis Forest

Philosophers discuss Jerome Wakefield's influential view of mental disorder as "harmful dysfunction," with detailed responses from Wakefield himself.

One of the most pressing theoretical problems of psychiatry is the definition of mental disorder. Jerome Wakefield's proposal that mental disorder is "harmful dysfunction" has been both influential and widely debated; philosophers have been notably skeptical about it. This volume provides the first book-length collection of responses by philosophers to Wakefield's harmful dysfunction analysis (HDA), offering a survey of philosophical critiques as well as extensive and detailed replies by Wakefield himself.

HDA is offered as a definition of mental disorder, but it is also the outcome of a method—conceptual analysis—and contributors first take up HDA's methodology, considering such topics as HDA's influences on the DSM, empirical support for HDA, and clinical practice. They go on to discuss HDA's ultimate goal, the demarcation between normal and abnormal; the dysfunction component of the analysis, addressing issues that include developmental plasticity, autism and neurodiversity, and the science of salience; and the harmful component, examining harmless dysfunction, normal variation, medicalization, and other questions. Wakefield offers substantive responses to each chapter.

Luc Faucher is Professor in the Philosophy Department at the University of Québec in Montréal. **Denis Forest** is Professor of Philosophy of Science in the Department of Philosophy at Paris 1 Panthéon-Sorbonne and Member of the IHPST (Institute of History and Philosophy of Science and Technique), Paris.

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philosophy

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Michael P. Lynch is Board of Trustees Distinguished Professor of Philosophy at the University of Connecticut, where he directs the Humanities Institute. In 2019 he was awarded the George Orwell Award for Distinguished Contribution to Honesty and Clarity in Public Language. **Jeremy Wyatt** is Lecturer in Philosophy at the University of Waikato in New Zealand. **Junyeol Kim** is Visiting Assistant Professor in Philosophy at the University of Connecticut. **Nathan Kellen** is Visiting Assistant Professor in Philosophy at Kansas State University.

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Ground-Truthing, Programming, Formulating

Florian Jaton

foreword by Geoffrey C. Bowker

A laboratory study that investigates how algorithms come into existence.

Algorithms—often associated with the terms big data, machine learning, or artificial intelligence—underlie the technologies we use every day, and disputes over the consequences, actual or potential, of new algorithms arise regularly. In this book, Florian Jaton offers a new way to study computerized methods, providing an account of where algorithms come from and how they are constituted, investigating the practical activities by which algorithms are progressively assembled rather than what they may suggest or require once they are assembled.

Drawing on a four-year ethnographic study of a computer science laboratory that specialized in digital image processing, Jaton illuminates the invisible processes that are behind the development of algorithms. Tracing what he terms a set of intertwining courses of actions sharing common finalities, he describes the practical activity of creating algorithms through the lenses of ground-truthing, programming, and formulating. He first presents the building of ground truths, referential repositories that form the material basis for algorithms. Then, after considering programming's resistance to ethnographic scrutiny, he describes programming courses of action he attended at the laboratory. Finally, he offers an account of courses of action that successfully formulated some of the relationships among the data of a ground-truth database, revealing the links between ground-truthing, programming, and formulating activities—entangled processes that lead to the shaping of algorithms. In practice, ground-truthing, programming, and formulating form a whirlwind process, an emergent and intertwined agency.

Florian Jaton is a Postdoctoral Researcher at the STS Lab at the University of Lausanne.

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Mad by the Millions

Mental Disorders and the Early Years of the World Health Organization

Harry Yi-Jui Wu

The World Health Organization's post–World War II work on the epidemiology and classification of mental disorders and its vision of a "world psyche."

In 1948, the World Health Organization (WHO) began to prepare its social psychiatry project, which aimed to discover the epidemiology and arrive at a classification of mental disorders. In *Mad by the Millions*, Harry Y-Jui Wu examines the WHO's ambitious project, arguing that it was shaped by the postwar faith in technology and expertise and the universalizing vision of a "world psyche." Wu shows that the WHO's idealized scientific internationalism laid the foundations for today's highly metricalized global mental health system.

Examining the interactions between the WHO and developing countries, Wu offers an analysis of the "transnationality" of mental health. He examines knowledge-sharing between the organization and African and Latin American collaborators, and looks in detail at the WHO's selection of a Taiwanese scientist, Tsung-yi Lin, to be its medical officer and head of the social psychiatry project. He discusses scientists' pursuit of standardization—not only to synchronize sectors in the organization but also to produce a common language of psychiatry—and how technological advances supported this. Wu considers why the optimism and idealism of the social psychiatry project turned to dissatisfaction, reappraising the WHO's early knowledge production modality through the concept of an "export processing zone." Finally, he looks at the WHO's project in light of current debates over psychiatry and global mental health, as scientists shift their concerns from the creation of universal metrics to the importance of local matrixes.

Harry Yi-Jui Wu is Associate Professor of Medical Humanities and Yushan Young Scholar at National Cheng-Kung University inTaiwan.

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The relationship between sound and space has become central to both creative practices in music and sound art and contemporary scholarship on sound. Entire subfields have emerged in connection to the spatial aspects of sound, from spatial audio and sound installation to acoustic ecology and soundscape studies. But how did our understanding of sound become spatial? In *Stereophonica*, Gascia Ouzounian examines a series of historical episodes that transformed ideas of sound and space, from the advent of stereo technologies in the nineteenth century to visual representations of sonic environments today.

Developing a uniquely interdisciplinary perspective, Ouzounian draws on both the history of science and technology and the history of music and sound art. She investigates the binaural apparatus that allowed nineteenth-century listeners to observe sound in three dimensions; examines the development of military technologies for sound location during World War I; revisits experiments in stereo sound at Bell Telephone Laboratories in the 1930s; and considers the creation of "optimized acoustical environments" for theaters and factories. She explores the development of multichannel "spatial music" in the 1950s and sound installation art in the 1960s; analyzes the mapping of soundscapes; and investigates contemporary approaches to sonic urbanism, sonic practices that reimagine urban environments through sound.

Rich in detail but accessible and engaging, and generously illustrated with photographs, drawings, maps, and diagrams of devices and artworks, *Stereophonica* brings an acute, imaginative, and much-needed historical sensibility to the growing literature around sound and space.

Gascia Ouzounian is Associate Professor in the Faculty of Music at the University of Oxford.

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Paris and the Parasite

Noise, Health, and Politics in the Media City

Macs Smith

The social consequences of anti-parasitic urbanism, as efforts to expunge noise and biological parasites penalize those viewed as social parasites.

According to French philosopher Michel Serres, ordered systems are founded on the pathologization of parasites, which can never be fully expelled. In *Paris and the Parasite*, Macs Smith extends Serres's approach to Paris as a mediatic city, asking what organisms, people, and forms of interference constitute its parasites. Drawing on French poststructuralist theory and philosophy, media theory, the philosophy of science, and an array of literary and cultural sources, he examines Paris and its parasites from the early nineteenth century to today, focusing on the contemporary city. In so doing, he reveals the social consequences of anti-parasitic urbanism.

Smith examines how media shape the design and experience of urban space, as well as how the city passes through layers of mediation. He asks what constitutes noise within a media city. Paris's municipal government views acoustic noise as a public health threat and calls for its elimination. But the government's proposals focus on reducing automobile traffic, making it harder for marginalized people to access the city. Thus, a push to eliminate a supposedly biological parasite banishes the so-called social parasites. Questioning the informatic ideologies undergirding modern urbanism, Smith shows both how this anti-parasitic urbanism works and how the banished outsiders noisily intervene, despite their exclusion from the centers of power. The expulsion of social, biological, and mediatic parasites is a governing theme of modern Paris, yet its parasites continually resurge. What is ultimately at stake is how we understand collective life.

Macs Smith is Career Development Fellow in French at the Queen's College at the University of Oxford.

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In the Images of Development

City Design in the Global South

Tridib Banerjee

The urban legacy of the Global South since the colonial era and how sustainable development and environmental and social justice can be achieved.

Remarkably little of the expansive literature on development and globalization considers actual urban form and the physical design of cities as outcomes of these phenomena. The development that has shaped historic transformations in urban form and urbanism—and the consequent human experiences—remains largely unexplored. In this book, Tridib Banerjee fills this void by linking the idea of development with those of urbanism, urban form, and urban design, focusing primarily on the contemporary cities in the developing world—the Global South—and their intrinsic prospects in city design. Further, he examines the endogenous possibilities for the future design of these cities that may address growing inequality and the environmental crisis.

Banerjee deftly traces the urban legacy of the Global South from the beginning of the colonial era, closely examining the economic, political, and ideological forces that influenced colonial and postcolonial development, drawing from relevant experiences of different cities in the developing world and discussing the arguments for the historic parity of these cities with their Western counterparts. Finally, Banerjee considers essential notions of future city design that are grounded in the critical challenges of sustainable development, equity, environmental and social justice, and diversity, and how such outcomes can be achieved. This book serves as the opening of a long overdue conversation among design, development, planning scholars and practitioners, and those interested in the urban development of the Global South.

Tridib Banerjee is Professor and the James Irvine Chair in Urban and Regional Planning at University of Southern California.

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