



The MIT Press
London Book Fair
2021 - Fall 2021
titles

How to Talk to a Science Denier

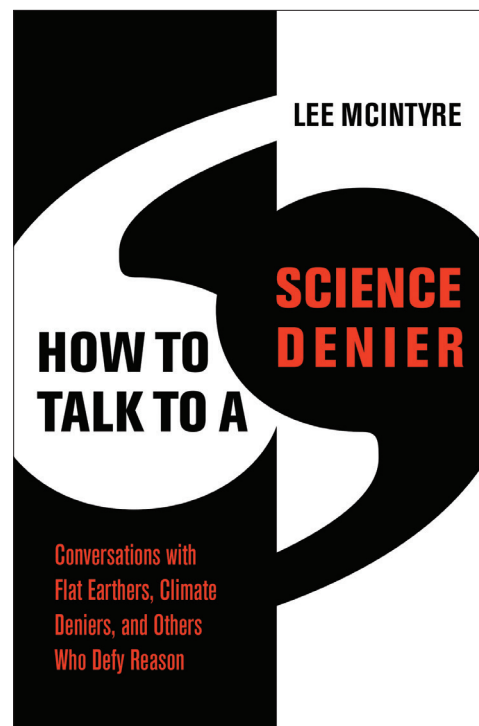
Conversations with Flat Earthers, Climate Deniers, and Others Who Defy Reason

Lee McIntyre

“Climate change is a hoax—and so is coronavirus.” “Vaccines are bad for you.” These days, many of our fellow citizens reject scientific expertise and prefer ideology to facts. They are not merely uninformed—they are misinformed. They cite cherry-picked evidence, rely on fake experts, and believe conspiracy theories. How can we convince such people otherwise? How can we get them to change their minds and accept the facts when they don’t believe in facts? In this book, Lee McIntyre shows that anyone can fight back against science deniers, and argues that it’s important to do so. Science denial can kill.

Drawing on his own experience—including a visit to a Flat Earth convention—as well as academic research, McIntyre outlines the common themes of science denialism, present in misinformation campaigns ranging from tobacco companies’ denial in the 1950s that smoking causes lung cancer to today’s anti-vaxxers. He describes attempts to use his persuasive powers as a philosopher to convert Flat Earthers; surprising discussions with coal miners; and conversations with a scientist friend about genetically modified organisms in food. McIntyre offers tools and techniques for communicating the truth and values of science, emphasizing that the most important way to reach science deniers is to talk to them calmly and respectfully—to put ourselves out there, to meet them face to face.

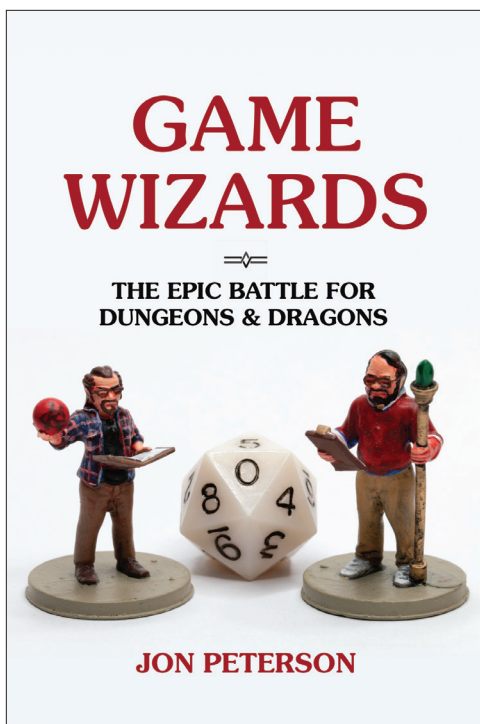
Lee McIntyre is a Research Fellow at the Center for Philosophy and History of Science at Boston University. He is the author of *Dark Ages: The Case for a Science of Human Behavior*, *Post-Truth*, and *The Scientific Attitude: Defending Science from Denial, Fraud, and Pseudoscience*, all published by the MIT Press.



Can we change the minds of science deniers? Encounters with flat earthers, anti-vaxxers, coronavirus truthers, and others.

August
6 x 9, 264 pp.

US \$24.95T/\$33.95 CAN cloth
978-0-262-04610-7



**The story of the arcane
table-top game that became
a pop culture phenomenon
and the long-running
legal battle waged by
its cocreators.**

October
6 x 9, 368 pp.

US \$24.95/33.95 CAN paper
978-0-262-54295-1

Game Histories series

Game Wizards

The Epic Battle for *Dungeons & Dragons*

Jon Peterson

When *Dungeons & Dragons* was first released to a small hobby community, it hardly seemed destined for mainstream success—and yet this arcane tabletop role-playing game became an unlikely pop culture phenomenon. In *Game Wizards*, Jon Peterson chronicles the rise of *Dungeons & Dragons* from hobbyist pastime to mass market sensation, from the initial collaboration to the later feud of its creators, Gary Gygax and Dave Arneson. As the game's fiftieth anniversary approaches, Peterson—a noted authority on role-playing games—explains how *D&D* and its creators navigated their successes, setbacks, and controversies.

Peterson describes Gygax and Arneson's first meeting and their work toward the 1974 release of the game; the founding of TSR and its growth as a company; and Arneson's acrimonious departure and subsequent challenges to TSR. He recounts the “Satanic Panic” accusations that *D&D* was sacrilegious and dangerous, and how they made the game famous. And he chronicles TSR's reckless expansion and near-fatal corporate infighting, which culminated with the company in debt and overextended and the end of Gygax's losing battle to retain control over TSR and *D&D*.

With *Game Wizards*, Peterson restores historical particulars long obscured by competing narratives spun by the one-time partners. That record amply demonstrates how the turbulent experience of creating something as momentous as *Dungeons & Dragons* can make people remember things a bit differently from the way they actually happened.

Jon Peterson, a leading expert on *Dungeons & Dragons* and role-playing games, is the author of *Playing at the World*, *Dungeons and Dragons Art & Arcana* (a Hugo Award finalist), the *New York Times* bestseller *Hero's Feast*, and *The Elusive Shift: How Role-Playing Games Forged Their Identity* (MIT Press).

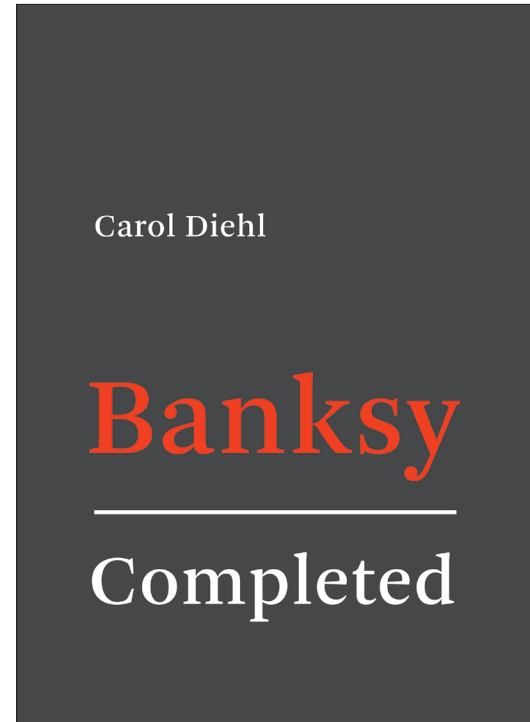
Banksy: Completed

Carol Diehl

Banksy is the world's most famous living artist, yet no one knows who he is. For more than twenty years, his wryly political and darkly humorous spray paintings have appeared mysteriously on urban walls around the globe, generating headlines and controversy. Art critics disdain him, but the public (and the art market) love him. With this generously illustrated book, artist and critic Carol Diehl is the first author to probe the depths of the Banksy mystery. Through her exploration of his paintings, installations, writings, and Academy Award-nominated film, *Exit through the Gift Shop*, Diehl proves unequivocally that there's more to Banksy than the painting on the wall.

Seeing Banksy as the ultimate provocateur, Diehl investigates the dramas that unfold after his works are discovered, with all of their social, economic, and political implications. She reveals how this trickster rattles the system, whether during his month-long 2013 self-styled New York "residency" or his notorious *Dismaland* of 2015, a full-scale dystopian "family theme park unsuitable for children" dedicated to the failure of capitalism. Banksy's work, Diehl shows, is a synthesis of conceptual art, social commentary, and political protest, played out not in museums but where it can have the most effect—on the street, in the real world. The questions Banksy raises about the uses of public and private property, the role of the global corporatocracy, the never-ending wars, and the gap between artworks as luxury goods and as vehicles of social expression, have never been more relevant.

Carol Diehl is an artist, poet, and art critic. Formerly a longtime contributing editor to *Art in America*, she has written for *ARTnews*, *Art + Auction*, *Art & Antiques*, *Metropolis*, and other publications.



There's more to Banksy than the painting on the wall: the first in-depth investigation into the mysteries of the world's most famous living artist.

October
7 x 9, 216 pp.
75 color illus.

US \$39.95T/\$53.95 CAN cloth
978-0-262-04624-4

Electrify

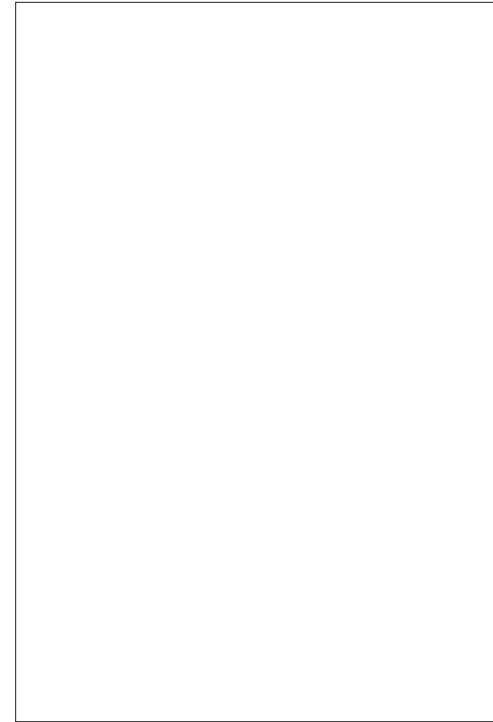
An Optimist's Playbook for Our Clean Energy Future

Saul Griffith

Climate change is a planetary emergency. We have to do something *now*—but what? Saul Griffith has a plan. In *Electrify*, Griffith lays out a detailed blueprint—optimistic but feasible—for fighting climate change while creating millions of new jobs and a healthier environment. Griffith's plan can be summed up simply: electrify everything. He explains exactly what it would take to transform our infrastructure, update our grid, and adapt our households to make this possible. Billionaires may contemplate escaping our worn-out planet on a private rocket ship to Mars, but the rest of us, Griffith says, will stay and fight for the future.

Griffith, an engineer and inventor, calls for grid neutrality, ensuring that households, businesses, and utilities operate as equals; we will have to rewrite regulations that were created for a fossil-fueled world, mobilize industry as we did in World War II, and offer low-interest "climate loans." Griffith's plan doesn't rely on big, not-yet-invented innovations, but on thousands of little inventions and cost reductions. We can still have our cars and our houses—but the cars will be electric and solar panels will cover our roofs. For a world trying to bounce back from a pandemic and economic crisis, there is no other project that would create as many jobs—up to twenty-five million, according to one economic analysis. Is this politically possible? We can change politics along with everything else.

Saul Griffith, inventor, entrepreneur, and engineer, is founder of Rewiring America, a non-profit dedicated to decarbonizing America by electrifying everything, and founder and chief scientist at Otherlab. He was a recipient of a MacArthur "genius grant" in 2007.



**An optimistic—but realistic
and feasible—action plan
for fighting climate change
while creating new jobs and
a healthier environment:
electrify everything.**

October
6 x 9, 272 pp.
printed endsheets
47 illus.

US \$24.95T/\$33.95 CAN cloth
978-0-262-04623-7

A Black Gaze

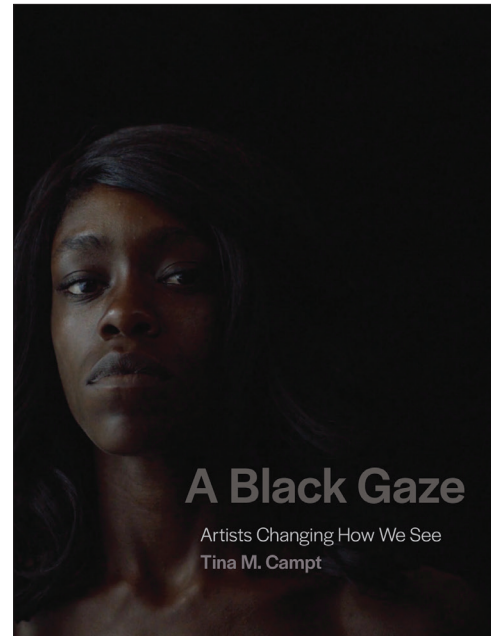
Artists Changing How We See

Tina M. Campt

In *A Black Gaze*, Tina Campt examines Black contemporary artists who are shifting the very nature of our interactions with the visual through their creation and curation of a distinctively Black gaze. Their work—from Deana Lawson’s disarmingly intimate portraits to Arthur Jafa’s videos of the everyday beauty and grit of the Black experience, from Khalil Joseph’s films and Dawoud Bey’s photographs to the embodied and multimedia artistic practice by Okwui Okpawasili, Simone Leigh, and Luke Willis Thompson—requires viewers to do more than simply look; it solicits visceral responses to the visualization of Black precarity.

Campt shows that this new way of seeing shifts viewers from the passive optics of looking *at* to the active struggle of looking *with*, *through*, and *alongside* the suffering—and joy—of Black life in the present. The artists whose work Campt explores challenge the fundamental disparity that defines the dominant viewing practice: the notion that Blackness is the elsewhere (or nowhere) of whiteness. These artists create images that flow, that resuscitate and revalue the historical and contemporary archive of Black life in radical ways. Writing with rigor and passion, Campt describes the creativity, ingenuity, cunning, and courage that is the modus operandi of a Black gaze.

Tina M. Campt, a Black feminist theorist of visual culture and contemporary art, is Owen F. Walker Professor of Humanities and Modern Culture and Media at Brown University and a Research Associate at the VIAD (Visual Identities in Art and Design Research Centre) at the University of Johannesburg. She is the author of *Image Matters: Archive, Photography and the African Diaspora in Europe*, *Listening to Images*, and other books.

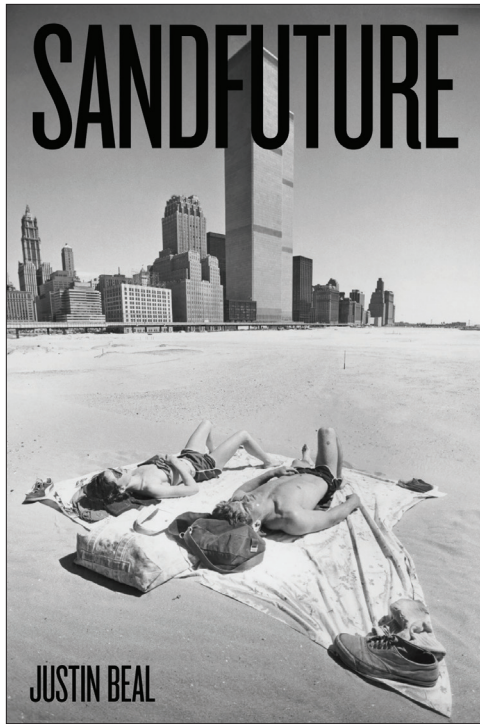


Examining the work of contemporary Black artists who are dismantling the white gaze and demanding that we see—and see Blackness in particular—anew.

August
6 x 8, 256 pp.
78 color illus., 33 b&w illus.

US \$34.95T/\$45.95 CAN cloth
978-0-262-04587-2

architecture



Sandfuture

Justin Beal

Sandfuture is a book about the life of the architect Minoru Yamasaki (1912–1986), who remains on the margins of history despite the enormous influence of his work on American architecture and society. That Yamasaki’s most famous projects—the Pruitt-Igoe apartments in St. Louis and the original World Trade Center in New York—were both destroyed on national television, thirty years apart, makes his relative obscurity all the more remarkable.

Sandfuture is also a book about an artist interrogating art and architecture’s role in culture as New York changes drastically after a decade bracketed by terrorism and natural disaster. From the central thread of Yamasaki’s life, *Sandfuture* spirals outward to include reflections on a wide range of subjects, from the figure of the architect in literature and film and transformations in the contemporary art market to the perils of sick buildings and the broader social and political implications of how, and for whom, cities are built. The result is at once sophisticated in its understanding of material culture and novelistic in its telling of a good story.

Justin Beal is an artist with an extensive exhibition history in the United States and Europe.

**An account of the life and
work of the architect
Minoru Yamasaki that leads
the author to consider how
(and for whom) architectural
history is written.**

September
6 x 9, 256 pp.
22 b&w illus.

US \$24.95T/\$33.95 CAN paper
978-0-262-54309-5

Designing Motherhood

Things That Make and Break Our Births

Michelle Millar Fisher and Amber Winick

foreword by Alexandra Lange

prologue by Erica Chidi

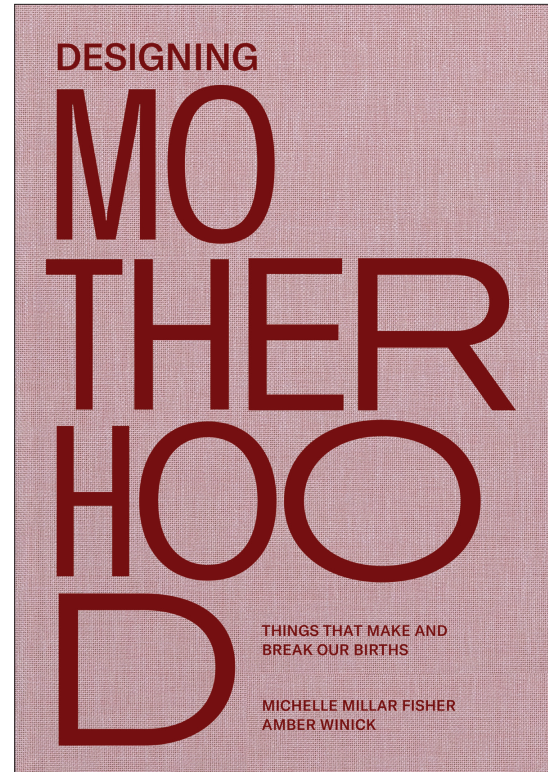
While birth often brings great joy, making babies is a knotty enterprise. The designed objects that surround us when it comes to menstruation, birth control, conception, pregnancy, childbirth, and early motherhood vary as oddly, messily, and dramatically as the stereotypes suggest. This smart, image-rich, fashion-forward, and design-driven book explores more than eighty designs—iconic, conceptual, archaic, titillating, emotionally charged, or just plain strange—that have defined the relationships between people and babies during the past century.

Each object tells a story. In striking images and engaging text, *Designing Motherhood* unfolds the compelling design histories and real-world uses of the objects that shape our reproductive experiences. The authors investigate the baby carrier, from the Snuggli to BabyBjörn, and the (re)discovery of the varied traditions of baby wearing; the tie-waist skirt, famously worn by a pregnant Lucille Ball on *I Love Lucy*, and essential for camouflaging and slowly normalizing a public pregnancy; the home pregnancy kit, and its threat to the authority of male gynecologists; and more. Memorable images—including historical ads, found photos, and drawings—illustrate the crucial role design and material culture plays throughout the arc of human reproduction.

Michelle Millar Fisher, a curator and architecture and design historian, is Ronald C. and Anita L. Wornick Curator of Contemporary Decorative Arts at the Museum of Fine Arts, Boston. **Amber Winick** is a writer, design historian, and recipient of two Fulbright Awards. Both lecture frequently on design, people, and the politics of things.

"I believe it is a work of major significance to design studies but also to feminism, gender studies, and cultural history. It certainly doesn't take an expected view of what constitutes 'design.'"

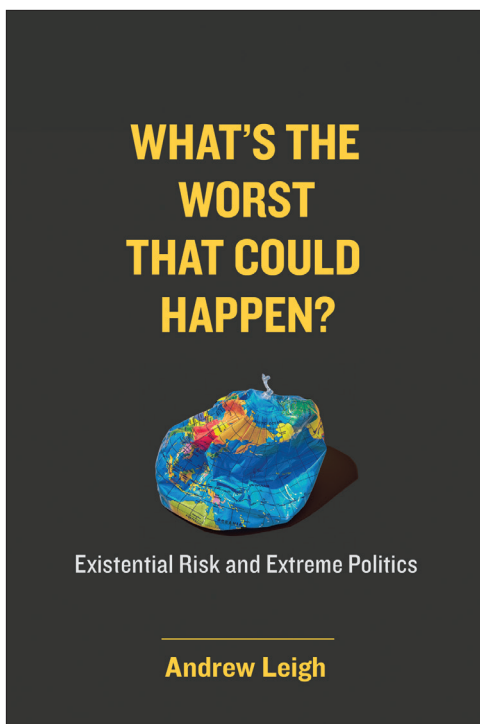
—**Ellen Lupton, Senior Curator of Contemporary Design, Cooper Hewitt, Smithsonian Design Museum; Betty Cooke and William O. Steinmetz Design Chair, Maryland Institute College of Art**



**More than eighty designs
—iconic, archaic, quotidian,
and taboo—that have
defined arc of human
reproduction.**

September
7 x 10, 344 pp.
125 color illus.

US \$44.95T/\$59.95 CAN cloth
978-0-262-04489-9



Why catastrophic risks are more dangerous than you think, and how populism makes them worse.

November
6 x 9, 232 pp.
3 illus.

US \$27.95T/\$36.95 CAN cloth
978-0-262-04607-7

What's the Worst That Could Happen?

Existential Risk and Extreme Politics

Andrew Leigh

Did you know that you're more likely to die from a catastrophe than in a car crash? The odds that a typical US resident will die from a catastrophic event—for example, nuclear war, bioterrorism, or out-of-control artificial intelligence—have been estimated at 1 in 6. That's fifteen times more likely than a fatal car crash and thirty-one times more likely than being murdered. In *What's the Worst That Could Happen?*, Andrew Leigh looks at catastrophic risks and how to mitigate them, arguing provocatively that the rise of populist politics makes catastrophe more likely.

Leigh explains that pervasive short-term thinking leaves us unprepared for long-term risks. Politicians sweat the small stuff—granular policy details of legislation and regulation—but rarely devote much attention to reducing long-term risks. Populist movements thrive on short termism because they focus on their followers' immediate grievances. Leigh argues that we should be long-termers: lengthen our thinking and give big threats the attention and resources they need.

Leigh outlines the biggest existential risks facing humanity and suggests remedies for them. He discusses pandemics, considering the possibility that the next virus will be more deadly than COVID-19; warns that unchecked climate change could render large swaths of the earth inhabitable; describes the metamorphosis of the arms race from a fight into a chaotic brawl; and examines the dangers of runaway superintelligence. Moreover, Leigh points out, populism (and its crony, totalitarianism) not only exacerbates other dangers, but is also a risk factor in itself, undermining the institutions of democracy as we watch.

Andrew Leigh is a Member of the Australian House of Representatives, and author of several books, including *Randomistas: How Radical Researchers Are Changing Our World* and (with Joshua Gans) *Innovation + Equality: How to Create a Future That Is More "Star Trek" Than "Terminator"* (MIT Press).

Command and Persuade

Crime, Law, and the State across History

Peter Baldwin

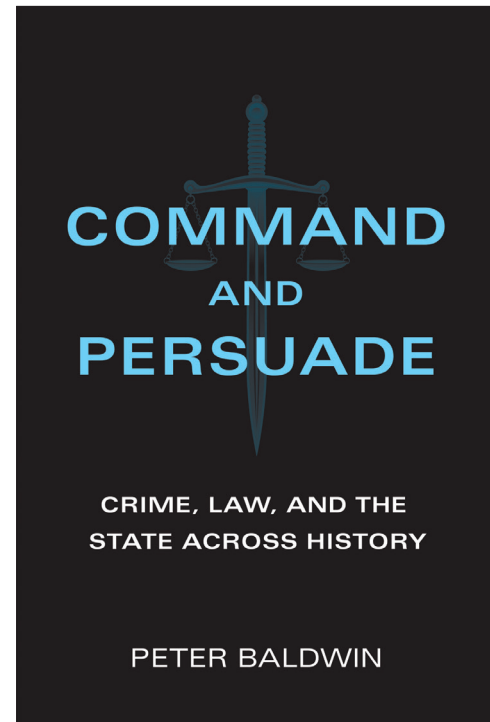
Levels of violent crime have been in a steady decline for centuries—for millennia, even. Over the past five hundred years, homicide rates have decreased a hundred-fold. We live in a time that is more orderly and peaceful than ever before in human history. Why, then, does fear of crime dominate modern politics? Why, when we have been largely socialized into good behavior, are there more laws that govern our behavior than ever before? In *Command and Persuade*, Peter Baldwin examines the evolution of the state's role in crime and punishment over three thousand years.

Baldwin explains that the involvement of the state in law enforcement and crime prevention is relatively recent. In ancient Greece, those struck by lightning were assumed to have been punished by Zeus. In the Hebrew Bible, God was judge, jury, and prosecutor when Cain killed Abel. As the state's power as lawgiver grew, more laws governed behavior than ever before; the sum total of prohibited behavior has grown continuously. At the same time, as family, community, and church exerted their influences, we have become better behaved and more law-abiding. Even as the state stands as the socializer of last resort, it also defines through law the terrain on which we are schooled into acceptable behavior.

Peter Baldwin is Professor of History at the University of California, Los Angeles, and Global Distinguished Professor in the Center for European and Mediterranean Studies at NYU. He is the author of *The Copyright Wars: Three Centuries of Trans-Atlantic Battle*, *The Narcissism of Minor Differences: How America and Europe Are Alike*, *Contagion and the State in Europe, 1830-1930*, and *Disease and Democracy: The Industrialized World Faces AIDS*.

"In this brilliant and wide-ranging study Peter Baldwin deftly demonstrates with a cornucopia of historical facts how in the course of centuries an increasingly law-abiding citizenry became more and more hemmed in by the state's proliferating prohibitions."

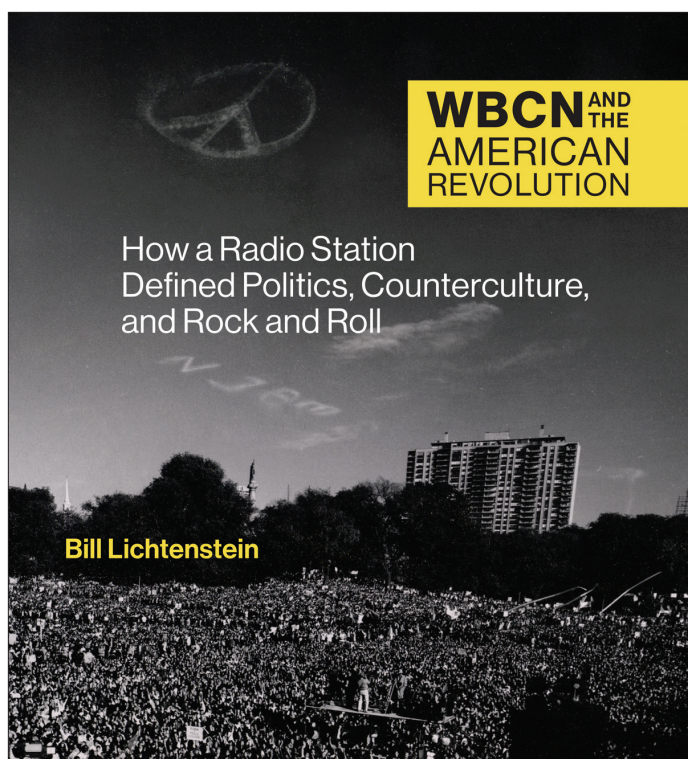
—**Abram de Swaan, Emeritus Distinguished Research Professor, University of Amsterdam**



Why, when we have been largely socialized into good behavior, are there more laws that govern our behavior than ever before?

October
6 x 9, 480 pp.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04562-9



**How Boston radio station
WBCN became the hub
of the rock-and-roll, antiwar,
psychedelic solar system.**

November
10 x 11, 304 pp.
282 illus.

US \$39.95T/\$53.95 CAN cloth
978-0-262-04625-1

US \$20.00T/\$27.00 CAN DVD-Video
978-0-262-04690-9

WBCN and the American Revolution

How a Radio Station Defined Politics, Counterculture, and Rock and Roll

Bill Lichtenstein

While San Francisco was celebrating a psychedelic Summer of Love in 1967, Boston stayed buttoned up and battened down. But that changed the following year, when a Harvard Law School graduate student named Ray Riepen founded a radio station that played music that young people, including the hundreds of thousands at Boston-area colleges, actually wanted to hear. WBCN-FM featured album cuts by such artists as the Mothers of Invention, Aretha Franklin, and Cream, played by announcers who felt free to express their opinions on subjects that ranged from recreational drugs to the war in Vietnam. In this engaging chronicle, Peabody Award-winning journalist and one-time WBCN announcer Bill Lichtenstein tells the story of how a radio station became part of a revolution in youth culture.

At WBCN, creativity and countercultural politics ruled: there were no set playlists; news segments anticipated the satire of *The Daily Show*; on-air interviewees ranged from John and Yoko to Noam Chomsky; a telephone “Listener Line” fielded questions on any subject, day and night. From 1968 to Watergate, Boston’s WBCN was the hub of the rock-and-roll, antiwar, psychedelic solar system. Interwoven through the narrative are excerpts from interviews with WBCN pioneers, including Charles Laquidara, the “news dissector” Danny Schechter, Marsha Steinberg, and Mitchell Kertzman.

Lichtenstein’s documentary *WBCN and the American Revolution* is available as a DVD sold separately.

Bill Lichtenstein is a journalist and documentary producer. Winner of more than sixty major journalism awards, he has written for publications including the *New York Times*, the *Nation*, the *Village Voice*, and the *Boston Globe*, and produced and directed the feature-

length documentary, *WBCN and The American Revolution*. He worked at WBCN from 1971 to 1977, beginning as a teenage volunteer on the station’s “Listener Line.”



Bill Lichtenstein at WBCN in 1973.
Photograph by Don Sanford.

Digital Suffragists

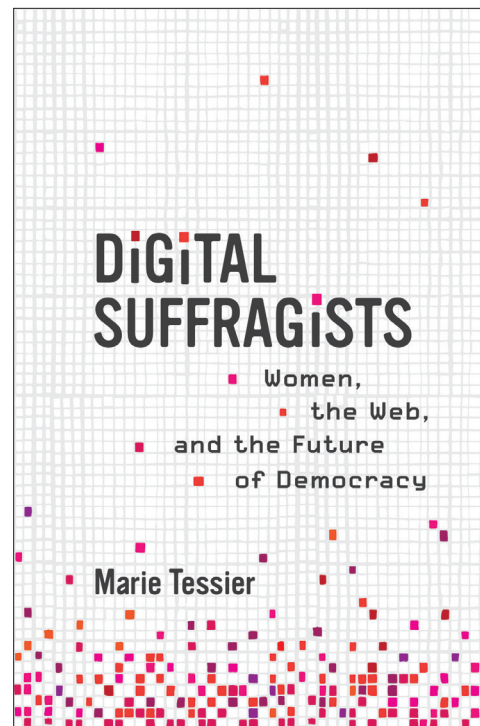
Women, the Web, and the Future of Democracy

Marie Tessier

If you've read the comments posted by readers of online news sites, you may have noticed the absence of women's voices. Men are by far the most prolific commenters on politics and public affairs. When women do comment, they are often attacked or dismissed more than men are. In fact, the comment forums on news sites replicate conditions of the offline and social media world, where women are routinely interrupted, threatened, demeaned, and called wrong, unruly, disgusting, and out of place. In *Digital Suffragists*, Marie Tessier—a veteran journalist and a *New York Times* comment moderator for more than a decade—investigates why women's voices are outnumbered online and what we can do about it.

The suffragists of the early twentieth century were jailed for trying to vote. Can a twenty-first century democracy be functional when half of the population is not fully represented in a primary form of political communication? Tessier shows that for online comments, it's a design problem: the linear blog comment formula was based on deeply gender-biased assumptions. Technologies designed with a broad range of end users in mind, she points out, are more successful and beneficial than those that reflect the designer's own habits of mind. Tessier outlines benchmarks for a more democratic media, all of which stem from one fundamental idea: media must adopt gender and racial representation as key performance indicators. Equal speaking time for women is a measure of democracy.

Marie Tessier is a journalist and writer who moderates comments to the opinion pages of the *New York Times*. Her work has appeared on the *Women's eNews* and *Women's Media Center* websites, in *Ms. magazine*, the *Columbia Journalism Review*, the *Washington Post*, the *Chicago Tribune*, and elsewhere.



Why women's voices are outnumbered online and what we can do about it, by a *New York Times* comment moderator.

October
6 x 9, 240 pp.
26 illus.

US \$27.95T/\$36.95 CAN cloth
978-0-262-04601-5

Water

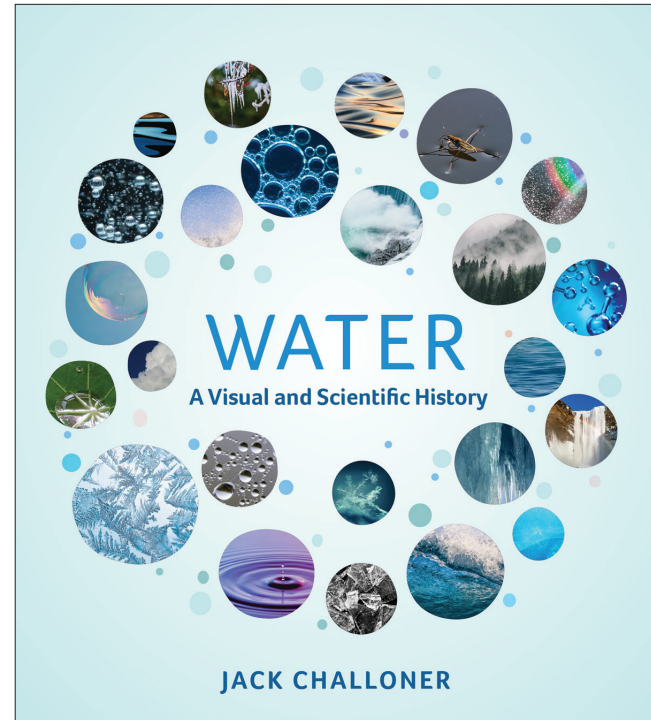
A Visual and Scientific History

Jack Challoner

Water is so ubiquitous in our lives that it is easy to take for granted. The average American uses ninety gallons of water a day; nearly every liquid we encounter is mostly water—milk, for example, is 87 percent water. Clouds and ice—water in other forms—affect our climate. Water is the most abundant substance on Earth, and the third-most abundant molecule in the universe. In this lavishly illustrated volume, science writer Jack Challoner tells the story of water, from its origins in the birth of stars to its importance in the living world.

Water is perhaps the most studied compound in the universe—although mysteries about it remain—and Challoner describes how thinkers from ancient times have approached the subject. He offers a detailed and fascinating look at the structure and behavior of water molecules, explores the physics of water—explaining, among other things, why ice is slippery—and examines the chemistry of water. He investigates photosynthesis and water's role in evolutionary history, and discusses water and weather, reviewing topics that range from snowflake science to climate change. Finally, he considers the possibility of water beyond our own hydrosphere—on other planets, on the Moon, in interstellar space.

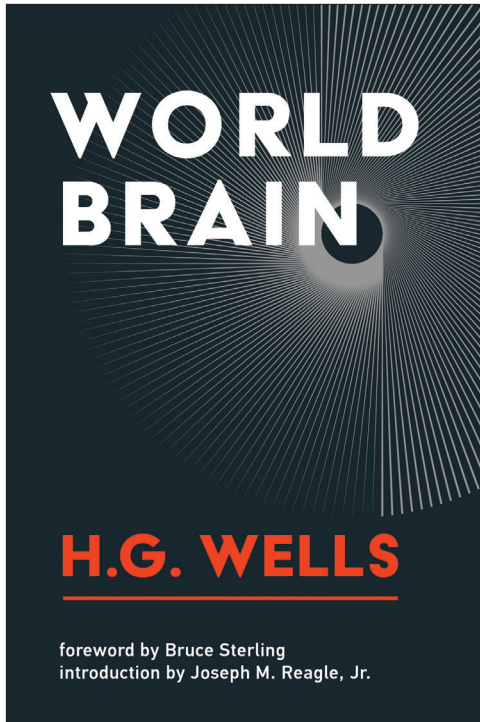
Jack Challoner is the author of more than forty books on science and technology, including *The Cell: A Visual Tour of the Building Block of Life*, which was shortlisted for the Royal Society of Biology Book Prize 2016, and *The Atom: A Visual Tour* (MIT Press).



The story of the most abundant substance on Earth, from its origins in the birth of stars billions of years ago to its importance in the living world.

August
8 x 9, 200 pp.
137 color illus., 6 b&w illus.

US \$39.95T/\$53.95 CAN cloth
978-0-262-04614-5



**In 1937, H. G. Wells proposed
a predigital, freely available
World Encyclopedia to
represent a civilization-saving
World Brain.**

August
5 1/4 x 8, 176 pp.
1 illus.

US \$24.95T/\$33.95 CAN paper
978-0-262-54256-2

World Brain

H. G. Wells

foreword by Bruce Sterling

introduction by Joseph M. Reagle Jr.

In a series of talks and essays in 1937, H. G. Wells proselytized for what he called a “World Brain,” as manifested in a World Encyclopedia—a repository of scientifically established knowledge—that would spread enlightenment around the world and lead to world peace. Wells, known to readers today as the author of *The War of the Worlds* and other science fiction classics, was imagining something like a predigital Wikipedia. The World Encyclopedia would provide a summary of verified reality (in about forty volumes); it would be widely available, free of copyright, and utilize the latest technology.

Of course, as Bruce Sterling points out in the foreword to this edition of Wells’s work, the World Brain didn’t happen; the internet did. And yet, Wells anticipated aspects of the internet, envisioning the World Brain as a technical system of networked knowledge (in Sterling’s words, a “hypothetical super-gadget”). Wells’s optimism about the power of information might strike readers today as naïvely utopian, but possibly also inspirational.

H. G. Wells (1866–1946) was a prolific and best-selling author of novels, short stories, and social commentary. Among his best-known works are *The Time Machine*, *The Invisible Man*, *War of the Worlds*, and *Tono-Bungay*. **Bruce Sterling** is a Hugo Award–winning science fiction author. **Joseph M. Reagle Jr.** is the coeditor of *Wikipedia @ 20* and the author of *Hacking Life* (both published by the MIT Press) and other books.

“A time-capsule from a moment perfectly like our own that could not be more different from our own—a vision of steampunk Wikipedian peace and noble truth vanquishing cynical lies. A utopia and a cautionary tale.”

—**Cory Doctorow**, author of *Attack Surface* and *How to Destroy Surveillance Capitalism*

Teaching Machines

A History of Personalized Learning

Audrey Watters

Contrary to popular belief, ed tech did not begin with videos on the internet. The idea of technology that would allow students to “go at their own pace” did not originate in Silicon Valley. In *Teaching Machines*, education writer Audrey Watters offers a lively history of predigital educational technology, from Sidney Pressey’s mechanized positive-reinforcement provider to B. F. Skinner’s behaviorist bell-ringing box. Watters shows that these machines and the pedagogy that accompanied them sprang from ideas—bite-sized content, individualized instruction—that had legs and were later picked up by textbook publishers and early advocates for computerized learning.

Watters pays particular attention to the role of the media—newspapers, magazines, television, and film—in shaping people’s perceptions of teaching machines as well as the psychological theories underpinning them. She considers these machines in the context of education reform, the political reverberations of Sputnik, and the rise of the testing and textbook industries. She chronicles Skinner’s attempts to bring his teaching machines to market, culminating in the famous behaviorist’s efforts to launch Didak 101, the “pre-verbal” machine that taught spelling. (Alternate names proposed by Skinner include “Autodidak,” “Instructomat,” and “Autostructor.”) Telling these somewhat cautionary tales, Watters challenges what she calls “the teleology of ed tech”—the idea that not only is computerized education inevitable, technological progress is the sole driver of events.

Audrey Watters is a writer on education and technology. She is the creator of the popular blog *Hack Education* (hackeducation.com) and the author of widely read annual reviews of educational technology news and products.

“Teaching Machines is a vital cultural history of our desire for a technical solution to the fundamentally social problem of how to make education work for all families. Watters has written the rare book that is necessary, important, and readable.”

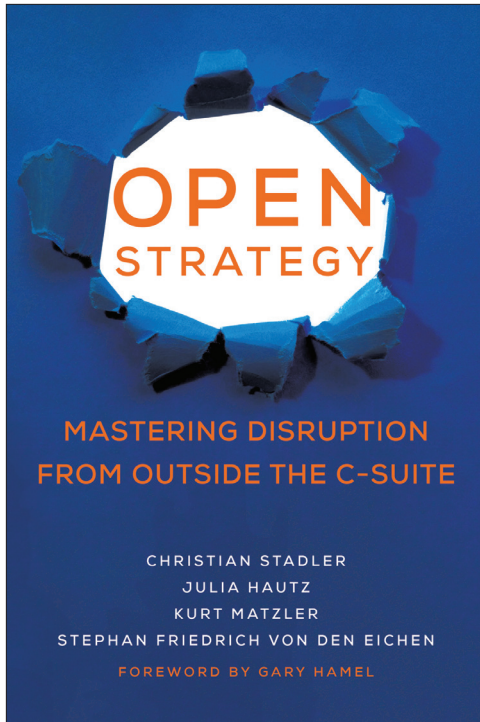
—**Tressie McMillan Cottom, Associate Professor, University of North Carolina at Chapel Hill; author of *Thick: And Other Essays***



**How ed tech was born:
Twentieth-century teaching
machines—from Sidney
Pressey’s mechanized test-
giver to B. F. Skinner’s
behaviorist bell-ringing box.**

August
5 1/4 x 8, 316 pp.

US \$34.95T/\$45.95 CAN cloth
978-0-262-04569-8



How smart companies are opening up strategic initiatives to involve front-line employees, experts, suppliers, customers, entrepreneurs, and even competitors.

October
6 x 9, 296 pp.
20 illus.

US \$29.95/\$39.95 CAN cloth
978-0-262-04611-4

**Management on the Cutting Edge series,
published in partnership with MIT Sloan
Management Review**

Open Strategy

Mastering Disruption from Outside the C-Suite

**Christian Stadler, Julia Hautz, Kurt Matzler,
and Stephan Friedrich von den Eichen**

foreword by Gary Hamel

Why are some of the world's most successful companies able to stay ahead of disruption, adopting and implementing innovative strategies, while others struggle? It's not because they hire a new CEO or expensive consultants. It's because these pioneering companies have adopted a new way of strategizing. Instead of keeping strategic deliberations within the C-Suite, they open up strategic initiatives to a diverse group of stakeholders—front-line employees, experts, suppliers, customers, entrepreneurs, and even competitors. *Open Strategy* presents a new philosophy, key tools, step-by-step advice, and fascinating case studies—from companies that range from Barclays to Domino's—to guide business leaders in this groundbreaking approach to strategy.

The authors—business-strategy experts from both academia and management consulting—introduce tools for each of the three stages of strategy-making: idea generation, plan formulation, and implementation. These are digital tools (including strategy contests), which allow the widest participation; hybrid digital/in-person tools (including a “nightmare competitor challenge”); a workshop tool that gamifies the business model development process; and tools that help companies implement and sustain open strategy efforts.

Open strategy has an astonishing track record: a survey of 200 business leaders shows that although open-strategy techniques were deployed for only 30 percent of their initiatives, those same initiatives generated 50 percent of their revenues and profits. This book offers a roadmap for this kind of success.

Christian Stadler is Professor of Strategic Management at Warwick Business School at Warwick University. **Julia Hautz** is Professor of Strategic Management at the University of Innsbruck. **Kurt Matzler** is Professor of Strategic Management at the University of Innsbruck, Academic Director of the Executive MBA program at MCI in Innsbruck, and Partner at the international management consulting firm IMP. **Stephan Friedrich von den Eichen** is Managing Partner at IMP and Professor of Business Model Innovation at the University of Bremen.

The Transformation Myth

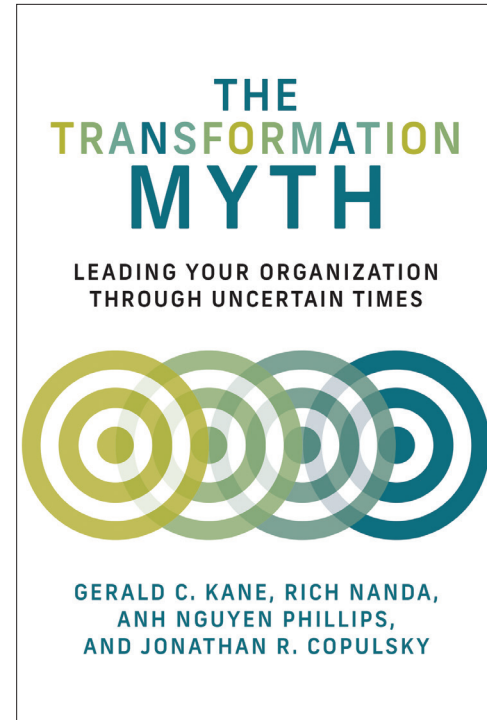
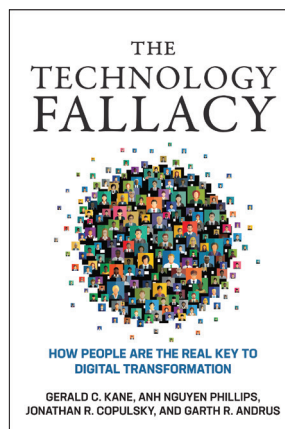
Leading Your Organization through Uncertain Times

**Gerald C. Kane, Rich Nanda, Anh Nguyen Phillips,
and Jonathan R. Copulsky**

When COVID-19 hit, businesses had to respond almost instantaneously—shifting employees to remote work, repairing broken supply chains, keeping pace with dramatically fluctuating customer demand. They were forced to adapt to a confluence of multiple disruptions inextricably linked to a longer term, ongoing digital disruption. This book shows that companies that use disruption as an opportunity for innovation emerge from it stronger. Companies that merely attempt to “weather the storm” until things go back to normal (or the next normal), on the other hand, miss an opportunity to thrive.

The authors, all experts on business and technology strategy, show that transformation is not a one-and-done event, but a continuous process of adapting to a volatile and uncertain environment. Drawing on five years of research into digital disruption—including a series of interviews with business leaders conducted during the COVID-19 crisis—they offer a framework for understanding disruption and tools for navigating it. They outline the leadership traits, business principles, technological infrastructure, and organizational building blocks essential for adapting to disruption, with examples from real-world organizations including Freddie Mac, Siemens Healthineers, Google Cloud, and KLM. Technology, they remind readers, is not an end in itself, but enables the capabilities essential for surviving an uncertain future: nimbleness, scalability, stability, and optionality.

Gerald C. Kane is Professor of Information Systems at Boston College. **Rich Nanda** is a principal at Deloitte Consulting, LLP, where he leads the strategy practice. **Anh Nguyen Phillips** is Research Lead at Deloitte Consulting, LLP. **Jonathan R. Copulsky** is Senior Lecturer of Marketing at Northwestern University, where he is also Executive Director of Medill Spiegel Research Center. Kane, Phillips, and Copulsky are coauthors of *The Technology Fallacy: How People Are the Real Key to Digital Transformation* (MIT Press).



**How companies can adapt in
an era of continuous disruption:
a guide to responding to such
acute crises as COVID-19.**

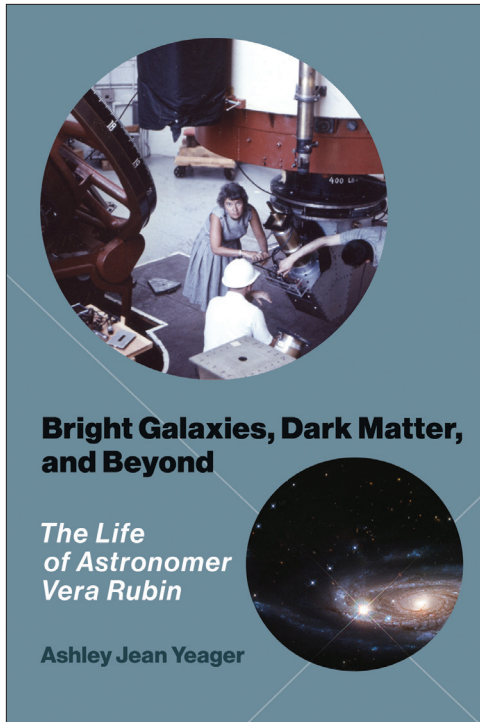
September
6 x 9, 216 pp.
8 illus.

US \$27.95/36.95 CAN cloth
978-0-262-04606-0

**Management on the Cutting Edge series,
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The Technology Fallacy
Gerald C. Kane, Anh Nguyen Phillips,
Jonathan R. Copulsky, and Garth R. Andrus
US \$29.95T/\$39.95 CAN cloth
978-0-262-03968-0



How Vera Rubin convinced the scientific community that dark matter might exist, persevering despite early dismissals of her work.

August
5 1/4 x 8, 248 pp.
3 color illus., 7 b&w illus.

US \$24.95T/\$33.95 CAN cloth
978-0-262-04612-1

Bright Galaxies, Dark Matter, and Beyond

The Life of Astronomer Vera Rubin

Ashley Jean Yeager

We now know that the universe is mostly dark, made up of particles and forces that are undetectable even by our most powerful telescopes. The discovery of the possible existence of dark matter and dark energy signaled a Copernican-like revolution in astronomy: not only are we not the center of the universe, neither is the stuff of which we're made. Astronomer Vera Rubin (1928–2016) played a pivotal role in this discovery. By showing that some astronomical objects seemed to defy gravity's grip, Rubin helped convince the scientific community of the possibility of dark matter. In *Bright Galaxies, Dark Matter, and Beyond*, Ashley Jean Yeager tells the story of Rubin's life and work, recounting her persistence despite early dismissals of her work and widespread sexism in science.

Yeager describes Rubin's childhood fascination with stars, her education at Vassar and Cornell, and her marriage to a fellow scientist who happened to be a student of Richard Feynman. (Feynman was later Rubin's own physics adviser.) At first, Rubin wasn't taken seriously; she was a rarity, a woman in science, and her findings seemed almost incredible. Some observatories in midcentury America restricted women from using their large telescopes; Rubin was unable to collect her own data until a decade after she had earned her PhD. Still, she continued her groundbreaking work, driving a scientific revolution. She received the National Medal of Science in 1993, but never the Nobel Prize—perhaps overlooked because of her gender. She's since been memorialized with a ridge on Mars, an asteroid, a galaxy, and most recently, the Vera C. Rubin Observatory—the first national observatory named after a woman.

Ashley Jean Yeager is Associate News Editor at Science News. She has written for *Quanta*, *Science News*, *Nature*, *Astronomy*, *Sky & Telescope*, *The Scientist*, and other publications.

Into the Anthropocosmos

A Whole Space Catalog from the MIT Space
Exploration Initiative

Ariel Ekblaw

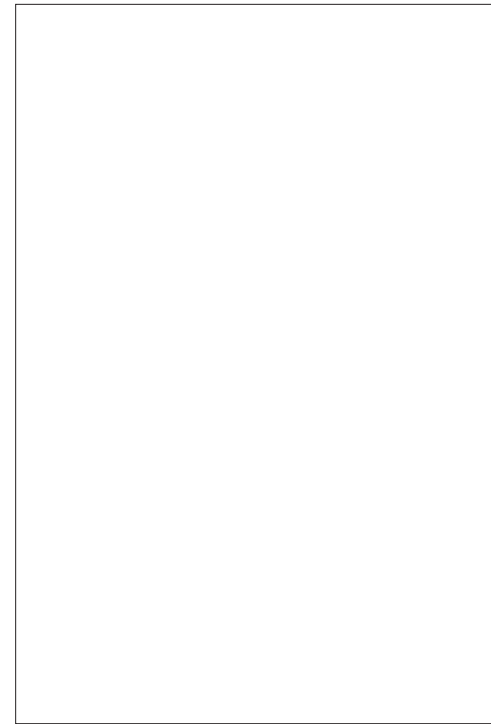
foreword by Catherine “Cady” Coleman

illustrated by Sands Fish

As Earthlings, we stand on the brink of a new age: the Anthropocosmos—an era of space exploration in which we can expand humanity’s horizons beyond our planet’s bounds. And in this new era, we have twin responsibilities, to Earth and to space; we should neither abandon our own planet to environmental degradation nor litter the galaxy with space junk. This fascinating and generously illustrated volume presents space technology for this new age: prototypes, artifacts, experiments, and habitats for an era of participatory space exploration.

These projects, developed as part of MIT’s Space Exploration Initiative, range from nanoscale imaging of microbes to responsive, sensor-mediated living environments. They show the usefulness of a seahorse tail for humans in microgravity, document the promise of shape-memory alloys for CubeSat in-orbit maneuvering, and introduce TESSERAE (Tessellated Electromagnetic Space Structures for the Exploration of Reconfigurable, Adaptive Environments), self-assembling space architecture. Some are ongoing, real-world systems: an art payload sent to the International Space Station via Space X CRS-20, for example, and a crowdsourced interplanetary cookbook. More than forty large-format, coffee table book-quality, full-color photographs make our future in space seem palpable. Short explanatory texts by Ariel Ekblaw, astronaut Cady Coleman, and others accompany the images.

Ariel Ekblaw is Founder and Director of the MIT Space Exploration Initiative at the MIT Media Lab. Her work has been featured in *WIRED*, *MIT Technology Review*, *Harvard Business Review*, the *Wall Street Journal*, and IASS and AIAA proceedings, and on the BBC, CNN, and NPR.



A lavishly illustrated catalog of space technology of the future: lab-tested devices, experiments, and habitats for the age of participatory space exploration.

September
11 x 9, 152 pp.
100 color illus.

US \$39.95T/\$53.95 CAN cloth
978-0-262-04637-4

Living with Robots

What Every Anxious Human Needs to Know

Ruth Aylett and Patricia A. Vargas

foreword by Noel Sharkey

The robots are coming, and they're going to take our jobs! Or, on second thought, perhaps they will be our friends! In case you haven't noticed, there's a lot of hype about robots; some of it is scary and some of it utopian. In this book, two robotics experts look beyond the fearmongering and the cheerleading to offer an engaging, accessible guide to robots: what they can (and can't) do, how they work, and what we can reasonably expect their future capabilities to be.

Ruth Aylett and Patricia Vargas discuss the history of our fascination with robots—from chatbots and prosthetics to autonomous cars and robot swarms. They outline the basic capabilities of robots—movement, navigation, and grasping and touching—and explain how robots see, feel, hear, think and learn. They describe how robots can cooperate, in applications ranging from robot football to search and rescue, and consider robots as pets, butlers, and companions. Finally, they look at robots that raise ethical and social issues: killer robots, sexbots, and robots that might be gunning for your job. *Living with Robots* equips readers to look at robots concretely—as human-made artifacts rather than placeholders for our anxieties.

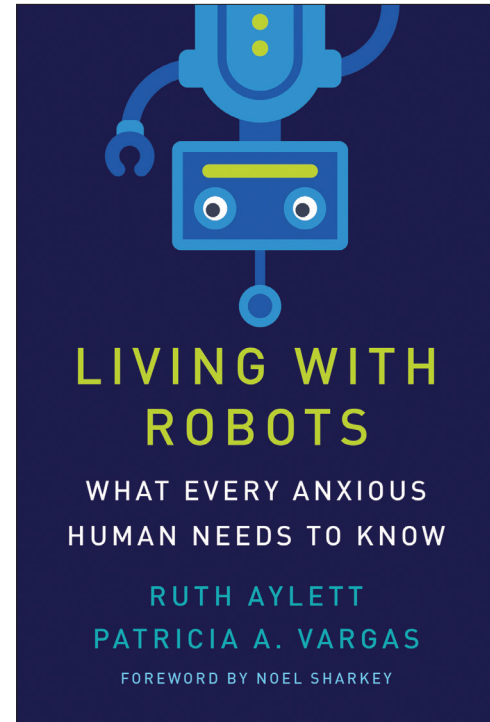
Ruth Aylett is Professor of Computer Science at Heriot-Watt University in Edinburgh. A robotics researcher for thirty years, she is the author of *Robots: Bringing Intelligent Machines to Life*. **Patricia A. Vargas** is Founder-Director of the Robotics Laboratory at Heriot-Watt University, where she is Associate Professor of Computer Science and Robotics. She is coeditor of *The Horizons of Evolutionary Robotics* (MIT Press).

"At last, after all the hype and drama about Robots taking over, comes a book by genuine experts and based on the latest science that shows us how robots will really feature in our lives."

—**Takanori Shibata, Chief Senior Research Science, AIST**

FIND OUT:

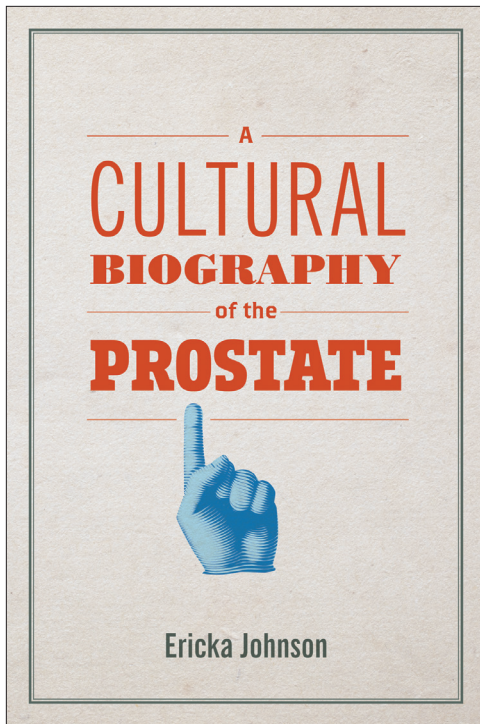
- WHY ROBOTS CAN SWIM AND FLY BUT FIND IT DIFFICULT TO WALK
- WHICH ROBOT FEATURES ARE INSPIRED BY ANIMALS AND INSECTS
- WHY WE DEVELOP FEELINGS FOR ROBOTS
- WHICH HUMAN ABILITIES ARE HARD FOR ROBOTS EMULATE



The truth about robots: two experts look beyond the hype, offering a lively and accessible guide to what robots can (and can't) do.

September
5 1/4 x 8, 312 pp.
20 illus.

US \$27.95T/\$36.95 CAN cloth
978-0-262-04581-0



What contemporary prostate angst tells us about how we understand masculinity, aging, and sexuality.

September
5 1/4 x 8, 280 pp.
8 illus.

US \$27.95T/\$36.95 CAN paper
978-0-262-54304-0

A Cultural Biography of the Prostate

Ericka Johnson

We are all suffering an acute case of prostrate angst. Men worry about their own prostates and those of others close to them; women worry about the prostates of the men they love. The prostate—a gland located directly under the bladder—lurks on the periphery of many men’s health issues, but as an object of anxiety it goes beyond the medical, affecting how we understand masculinity, aging, and sexuality. In *A Cultural Biography of the Prostate*, Ericka Johnson investigates what we think the prostate is and what we use the prostate to think about, examining it in historical, cultural, social, and medical contexts.

Johnson shows that our ways of talking about, writing about, imagining, and imaging the prostate are a mess of entangled relationships. She describes current biomedical approaches, reports on the “discovery” of the prostate in the sixteenth century and its later appearance as both medical object and discursive trope, and explores present-day diagnostic practices for benign prostate hyperplasia—which transform a process (urination) into a thing (the prostate). Turning to the most anxiety-provoking prostate worry, prostate cancer, Johnson discusses PSA screening and the vulnerabilities it awakens (or sometimes silences) and then considers the presence of the absent prostate—how the prostate continues to affect lives after it has been removed in the name of health.

Ericka Johnson is Professor of Gender and Society at Linköping University in Sweden. She is the author of *Dreaming of a Mail-Order Husband: Russian-American Internet Romance*, *Refracting through Technologies: Bodies, Medical Technologies and Norms*, and other books.

How Not to Study a Disease

The Story of Alzheimer's

Karl Herrup

For decades, some of our best and brightest medical scientists have dedicated themselves to finding a cure for Alzheimer's disease. What happened? Where is the cure? The biggest breakthroughs occurred twenty-five years ago, with little progress since. In *How Not to Study a Disease*, neurobiologist Karl Herrup explains why the Alzheimer's discoveries of the 1990s didn't bear fruit, and maps a direction for future research. Herrup describes the research, explains what's taking so long, and maps out an approach for resetting future research.

Herrup offers a unique insider's perspective, describing the red flags that science ignored in the rush to find a cure. He is unsparing in calling out the stubbornness, greed, and bad advice that has hamstrung the field, but his final message is a largely optimistic one. Herrup presents a new and sweeping vision of the field that includes a redefinition of the disease and a fresh conceptualization of aging and dementia that asks us to imagine the brain as a series of interconnected "neighborhoods." He calls for changes in virtually every aspect of the Alzheimer's disease research effort, from the drug development process, to the mechanisms of support for basic research, to the often-overlooked role of the scientific media, and more. With *How Not to Study a Disease*, Herrup provides a roadmap that points us in a new direction in our journey to a cure for Alzheimer's.

Karl Herrup is Professor of Neurobiology and an Investigator in the Alzheimer's Disease Research Center at the University of Pittsburgh School of Medicine and Adjunct Professor of Life Science at the Hong Kong University of Science and Technology, where he was formerly Head of Life Sciences.



An authority on Alzheimer's disease offers a history of past failures and a roadmap that points us in a new direction in our journey to a cure.

October
6 x 9, 272 pp.
28 illus.

US \$27.95T/\$36.95 CAN cloth
978-0-262-04590-2

They Knew

The US Federal Government's Fifty-Year Role in Causing the Climate Crisis

James Gustave Speth

introduction by Julia Olson and Phil Gregory

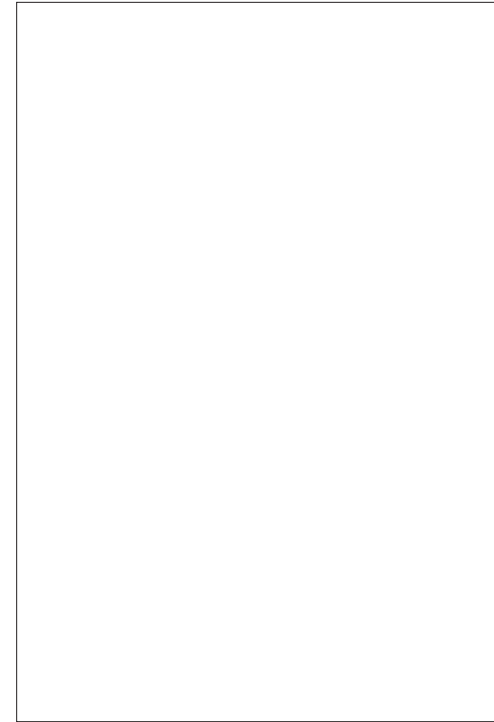
In 2015, a group of twenty-one young people sued the federal government in *Juliana v. United States* for violating their constitutional rights by promoting climate catastrophe and thereby depriving them of life, liberty, and property without due process and equal protection of law. *They Knew* offers evidence supporting the children's claims, presenting a devastating and compelling account of the federal government's role in bringing about today's climate crisis. James Gustave Speth, tapped by the plaintiffs as one of twenty-one preeminent experts in their climate case, analyzes how administrations from Carter to Trump—despite having information about the impending climate crisis and the connection to fossil fuels—continued aggressive support of a fossil fuel-based energy system.

What did the federal government know and when did it know it? Speth asks, echoing another famous cover-up. What did the federal government actively do and what did it fail to do? *They Knew* (an updated version of the Expert Report Speth prepared for the lawsuit) presents the most definitive indictment yet of the US government's role in the climate crisis.

Since *Juliana v. United States* was filed, the federal government has repeatedly taken unprecedented steps to delay the case and force it to the appellate courts' shadow dockets. Yet as the case progresses slowly but certainly, it is inspiring a generation of youthful climate activists.

An Our Children's Trust Book.

James Gustave Speth served as Chair of the US Council on Environmental Quality during the Carter Administration, and from 1993 to 1999 was Administrator of the United Nations Development Programme. A retired Professor of Law at the Vermont Law School, he served for a decade as Dean of the Yale School of the Environment and was cofounder of the World Resources Institute and the Natural Resources Defense Council. **Julia Olson** is Executive Director and Chief Legal Counsel at Our Children's Trust (OCT), the only nonprofit law firm representing youth in science-based climate litigation around the globe. **Phil Gregory** is Of Counsel with OCT and a renowned trial lawyer, honored by inclusion in the International Academy of Trial Lawyers and the American Board of Trial Advocates. Both Olson and Gregory represent the plaintiffs in *Juliana v. United States*.



A devastating, compelling account of the federal government's leading role in bringing about today's climate crisis.

August
6 x 9, 280 pp.
21 illus.

US \$27.95T/\$36.95 CAN cloth
978-0-262-54298-2

The Work of the Future

Building Better Jobs in an Age of Intelligent Machines

David Autor, David A. Mindell, and Elisabeth B. Reynolds

foreword by Robert M. Solow

The United States has too many low-quality, low-wage jobs. Every country has its share, but those in the United States are especially poorly paid and often without benefits. Meanwhile, overall productivity increases steadily and new technology has transformed large parts of the economy, enhancing the skills and paychecks of higher paid knowledge workers. What's wrong with this picture? Why have so many workers benefited so little from decades of growth? *The Work of the Future* shows that technology is neither the problem nor the solution. We can build better jobs if we create institutions that leverage technological innovation and also support workers through long cycles of technological transformation.

Building on findings from the multiyear MIT Task Force on the Work of the Future, the book argues that we must foster institutional innovations that complement technological change. Skills programs that emphasize work-based and hybrid learning (in person and online), for example, empower workers to become and remain productive in a continuously evolving workplace. Industries fueled by new technology that augments workers can supply good jobs, and federal investment in R&D can help make these industries worker-friendly. We must act to ensure that the labor market of the future offers benefits, opportunity, and a measure of economic security to all.

David Autor is Ford Professor in the MIT Department of Economics. **David A. Mindell** is Professor of Aeronautics and Astronautics and Dibner Professor of the History of Engineering and Manufacturing at MIT and founder and CEO of Humatics Corporation. Autor and Mindell were Cochairs of the MIT Task Force on the Work of the Future. **Elisabeth Reynolds** is Special Assistant to the President for Manufacturing and Economic Development on the National Economic Council and was Executive Director of the MIT Task Force on the Work of the Future.

Why the United States lags behind other industrialized countries in sharing the benefits of innovation with workers and how we can remedy the problem.

November
6 x 9, 192 pp.
15 illus.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04636-7

From the Basement to the Dome

How MIT's Unique Culture Created a Thriving Entrepreneurial Community

Jean-Jacques Degroof

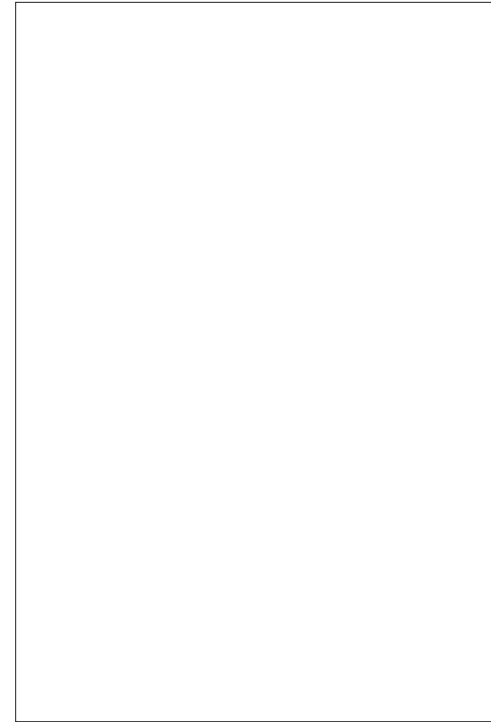
MIT is world-famous as a launching pad for entrepreneurs. MIT alumni have founded at least 30,000 active companies, employing an estimated 4.6 million people, with revenues of approximately \$1.9 trillion. In the 2010s, twenty to thirty ventures were spun off each year to commercialize technologies developed in MIT labs (with intellectual property licensed by MIT to these companies); in the same decade, MIT graduates started an estimated 100 firms per year. How has MIT become such a hotbed of entrepreneurship? In *From the Basement to the Dome*, Jean-Jacques Degroof describes how MIT's problem-solving ethos, multidisciplinary approach, and experimental mindset nurture entrepreneurship.

Degroof explains that at first, the culture of entrepreneurship sprang from such extracurricular activities as forums, clubs, and competitions. Eventually, the Institute formally supported these activities, offering courses in entrepreneurship. Degroof describes why entrepreneurship is so uniquely aligned with MIT's culture: a history of bottom-up decision-making, a tradition of academic excellence, a keen interest in problem-solving, a belief in experimentation, and a tolerance for failure on the way to success. Entrepreneurship is the logical outcome of MIT's motto, *Mens et Manus* (mind and hand), translating theories and scientific discoveries into products and businesses—many of which have the goal of solving some of world's most pressing problems. Degroof maps MIT's current entrepreneurial ecosystem of students, faculty, and researchers; considers the effectiveness of teaching entrepreneurship; and outlines ways that the MIT story could inspire conversations in other institutions about promoting entrepreneurship.

Jean-Jacques Degroof has worked in academia, financial services, and venture investment, working with technology start-ups in both the United States and Europe. He holds an MS and PhD from the MIT Sloan School of Management.

"Degroof does an outstanding job describing how MIT's culture of experimentation, problem-solving, and tolerance to failure, has led to the creation of what is now a fertile ground for entrepreneurial ventures."

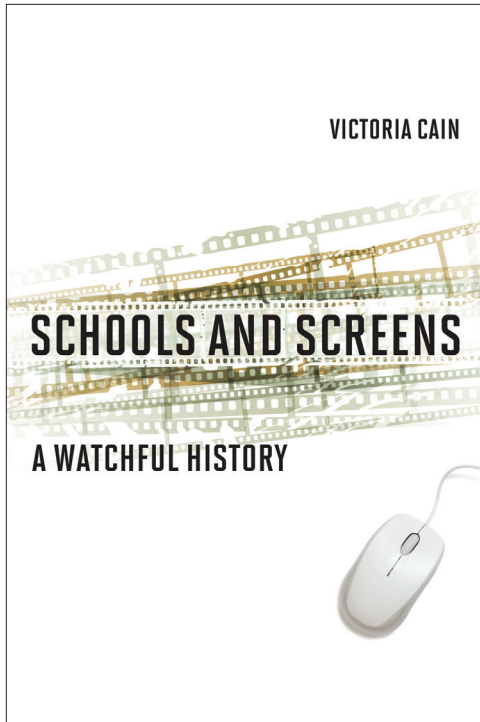
—**Adrian Garcia-Aranyos, President, Endeavor**



How a bottom-up problem-solving ethos, multidisciplinary approach, and experimental mindset have nurtured entrepreneurship at MIT.

September
6 x 9, 320 pp.
12 illus.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04615-2



Why screens in schools—from film screenings to instructional television to personal computers—did not bring about the educational revolution promised by reformers.

October
6 x 9, 288 pp.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04523-0

Schools and Screens

A Watchful History

Victoria Cain

Long before Chromebook giveaways and remote learning, screen media technologies were enthusiastically promoted by American education reformers. Again and again, as schools deployed film screenings, television programs, and computer games, screen-based learning was touted as a cure for all educational ills. But the transformation promised by advocates for screens in schools never happened. In this book, Victoria Cain chronicles important episodes in the history of educational technology, as reformers, technocrats, public television producers, and computer scientists tried to harness the power of screen-based media to shape successive generations of students.

Cain describes how, beginning in the 1930s, champions of educational technology saw screens in schools as essential tools for training citizens, and presented films to that end. (Among the films screened for educational purposes was the notoriously racist *Birth of a Nation*.) In the 1950s and 1960s, both technocrats and leftist educators turned to screens to prepare young Americans for Cold War citizenship, and from the 1970s through the 1990s, as commercial television and personal computers arrived in classrooms, screens in schools represented an increasingly privatized vision of schooling and civic engagement. Cain argues that the story of screens in schools is not simply about efforts to develop the right technological tools; rather, it reflects ongoing tensions over citizenship, racial politics, private funding, and distrust of teachers. Ultimately, she shows that the technologies that reformers had envisioned as improving education and training students in civic participation in fact deepened educational inequities.

Victoria Cain is Associate Professor of History at Northeastern University and coauthor of *Life on Display: Revolutionizing U.S. Museums of Science and Natural History in the Twentieth Century*.

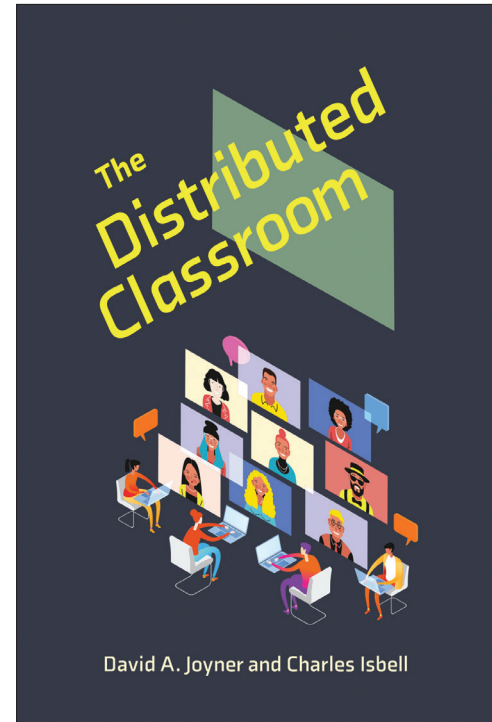
The Distributed Classroom

David A. Joyner and Charles Isbell

What if there were a model for learning in which the classroom experience was distributed across space and time—and students could still have the benefits of the traditional classroom, even if they can't be present physically or learn synchronously? In this book, two experts in online learning envision a future in which education from kindergarten through graduate school need not be tethered to a single physical classroom. The distributed classroom would neither sacrifice students' social learning experience nor require massive development resources. It goes beyond hybrid learning, so ubiquitous during the pandemic, and MOOCs, so trendy a few years ago, to reimagine the classroom itself.

David Joyner and Charles Isbell, both of Georgia Tech, explain how recent developments, including distance learning and learning management systems, have paved the way for the distributed classroom. They propose that we dispense with the dichotomy between online and traditional education, and the assumption that online learning is necessarily inferior. They describe the distributed classroom's various delivery modes—for in-person students, remote synchronous students, and remote asynchronous students; the goal would be a symmetry of experiences, with both students and teachers able to move from one mode to another. With *The Distributed Classroom*, Joyner and Isbell offer an optimistic, learner-centric view of the future of education, in which every person on earth can be a potential learner as barriers of cost, geography, and synchronicity disappear.

David A. Joyner is Executive Director of Online Education & OMSCS, in the College of Computing at Georgia Institute of Technology. **Charles Isbell** is John P. Imlay Jr. Dean of the College of Computing at Georgia Institute of Technology.



A vision of the future of education in which the classroom experience is distributed across space and time without compromising learning.

September
5 1/4 x 8, 360 pp.
2 illus.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04605-3

Learning in Large-Scale Environments series



**Understanding digital
technology in daily life:
why we should think holistically
in terms of a digital environment
instead of discrete devices
and apps.**

August
5 1/4 x 8, 216 pp.

US \$24.95T/\$33.95 CAN cloth
978-0-262-04619-0

The Digital Environment

How We Live, Learn, Work, and Play Now

Pablo J. Boczkowski and Eugenia Mitchelstein

Increasingly we live through our personal screens; we work, play, socialize, and learn digitally. The shift to remote everything during the pandemic was another step in a decades-long march toward the digitization of everyday life made possible by innovations in media, information, and communication technology. In *The Digital Environment*, Pablo Boczkowski and Eugenia Mitchelstein offer a new way to understand the role of the digital in our daily lives, calling on us to turn our attention from our discrete devices and apps to the array of artifacts and practices that make up the digital environment that envelops every aspect of our social experience.

Boczkowski and Mitchelstein explore a series of issues raised by the digital takeover of everyday life, drawing on interviews with a variety of experts. They show how existing inequities of gender, race, ethnicity, education, and class are baked into the design and deployment of technology, and describe emancipatory practices that counter this—including the use of Twitter as a platform for activism through such hashtags as #BlackLivesMatter and #MeToo. They discuss the digitization of parenting, schooling, and dating—noting, among other things, that today we can both begin and end relationships online. They describe how digital media shapes our consumption of sports, entertainment, and news, and consider the dynamics of political campaigns, disinformation, and social activism. Finally, they report on developments in three areas that will be key to our digital future: data science, virtual reality, and space exploration.

Pablo J. Boczkowski is Hamad Bin Khalifa Al-Thani Professor in the Department of Communication Studies at Northwestern University. **Eugenia Mitchelstein** is Associate Professor and Chair of the Social Sciences Department and Director of the Communication Degree at the University of San Andrés in Buenos Aires. Boczkowski and Mitchelstein are coauthors of *The News Gap: When the Information Preferences of the Media and the Public Diverge* (MIT Press).

Running with Robots

The American High School's Third Century

Greg Toppo and Jim Tracy

What will high school education look like in twenty years? High school students are educated today to take their places in a knowledge economy. But the knowledge economy, based on the assumption that information is a scarce and precious commodity, is giving way to an economy in which information is ubiquitous, digital, and machine-generated. In *Running with Robots*, Greg Toppo and Jim Tracy show how the technological advances that are already changing the world of work will transform the American high school as well.

Toppo and Tracy—a journalist and an education leader, respectively—look at developments in artificial intelligence and other fields that promise to bring us not only driverless cars but doctorless patients, lawyerless clients, and possibly even teacherless students. They visit schools from New York City to Iowa that have begun preparing for this new world. Toppo and Tracy intersperse these reports from the present with bulletins from the future, telling the story of a high school principal who, Rip Van Winkle-style, sleeps for twenty years and, upon awakening in 2040, can hardly believe his eyes: the principal's amazingly efficient assistant is a robot, calculation is outsourced to computers, and students, grouped by competence and not grade level, focus on the conceptual. The lesson to be learned from both the present and the book's thought-experiment future: human and robotic skillsets are complementary, not in competition. We can run with robots, not against them.

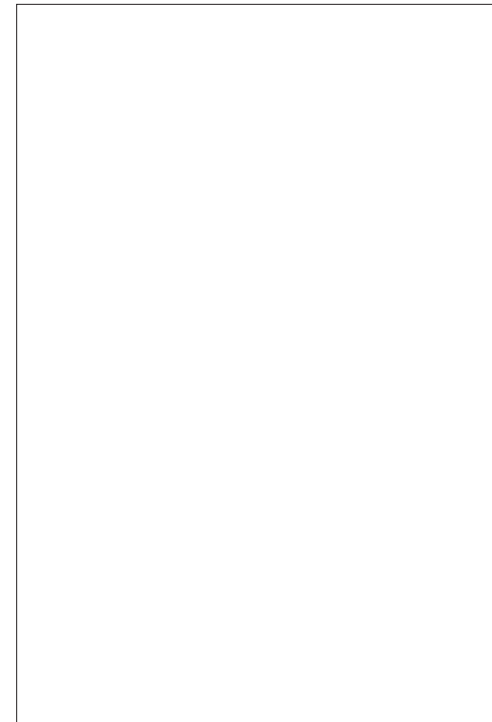
Greg Toppo, a journalist who has covered education for more than twenty years, is the author of *The Game Believes in You: How Digital Play Can Make Our Kids Smarter*. **Jim Tracy** is Senior Advisor at Jobs for the Future (JFF) and Senior Scholar of the Center for Character and Social Responsibility at Boston University's Wheelock School of Education. He has been head of several independent schools and a college president.

"Mixing history with story-telling, prediction with fact, this gem of a book creatively stimulates the reader to think about what an ideal education is going to look like in the years and decades ahead. Every educator will read it with pleasure and come away with new and useful perspectives."

—**Stephen M. Kosslyn, President, Active Learning Sciences, and Chief Academic Officer, Foundry College; author of *Active Learning Online***

"Delightful! A smart take on the future of school, presented with style. I can't remember the last time I had this much fun reading a book about education reform."

—**Jordan Shapiro, author of *Father Figure* and *The New Childhood***



How the technological changes that are reshaping the future of work will transform the American high school as well.

September
5 1/4 x 8, 200 pp.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04589-6

Designed for Dancing

How Midcentury Records Taught America to Dance

Janet Borgerson and Jonathan Schroeder

In midcentury America, eager dancers mamboed in the kitchen, waltzed in the living room, Watusied at the nightclub, and polkaed in the pavilion, instructed (and inspired) by dance records. Glorious, full-color record covers encouraged them: “Let’s Cha Cha Cha,” “Second Honeymoon Dance,” “Hullabaloo Au Go-Go!!!” “Limbo Dance Party,” “Twistin’ in High Society.” In *Designed for Dancing*, vinyl record aficionados and collectors Janet Borgerson and Jonathan Schroeder examine dance records of the 1950s and 1960s as expressions of midcentury culture, identity, fantasy, and desire.

Borgerson and Schroeder begin with the record covers—memorable and striking, but largely designed and created by now-forgotten photographers, scenographers, and illustrators—which were central to the way records were conceived, produced, and promoted. Dancing allowed people to sample aspirational lifestyles, whether at the Plaza or in a smoky Parisian café, and to affirm ancestral identities with Irish, Polish, or Greek folk dancing. Dance records featuring ethnic music of variable authenticity and appropriateness invited consumers to dance in the footsteps of the Other with “hot” Latin music, Afro-Caribbean rhythms, and Hawaiian hulas. Bought at a local supermarket, department store, or record shop, and listened to in the privacy of home, midcentury dance records offered instruction in how to dance, how to dress, how to date, and how to discover cool new music—lessons for harmonizing with the rest of postwar America.

Janet Borgerson is Wicklander Fellow at DePaul University. **Jonathan Schroeder** is William A. Kern Professor in the School of Communication, Rochester Institute of Technology. They are the authors of *Designed for Hi-Fi Living: The Vinyl LP in Midcentury America* (MIT Press), named a best book of 2017 by the *Financial Times* and a best music book of 2017 by Vinyl Factory.

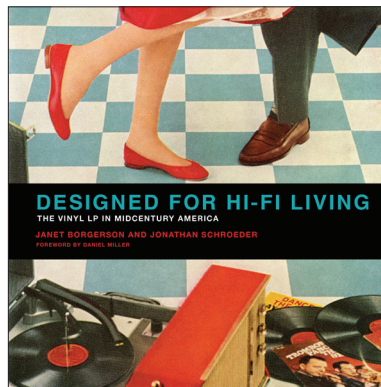
When Americans mamboed in the kitchen, waltzed in the living room, polkaed in the pavilion, and tangoed at the club; with glorious, full-color record cover art.

October
8 x 10, 552 pp.
292 color illus.

US \$49.95T/\$65.95 CAN cloth
978-0-262-04433-2

Also available

Designed for Hi-Fi Living
Janet Borgerson and Jonathan Schroeder
US \$22.95T/\$29.95 CAN paper
978-0-262-53601-1



Your Wit Is My Command

Building AIs with a Sense of Humor

Tony Veale

Computers and smart devices are not known for their joke-telling abilities. And yet, as Tony Veale explains in *Your Wit Is My Command*, machines are not inherently unfunny; they are just programmed that way. By examining the mechanisms of humor and jokes—how humor actually works—Veale shows that computers can be built with a sense of humor, capable not only of producing a joke but also of appreciating one. Along the way, he explores the humor-generating capacities of fictional robots ranging from B-9 in *Lost in Space* to TARS in *Interstellar*, maps out possible scenarios for developing witty robots, and investigates such aspects of humor as puns, sarcasm, and offensiveness.

In order for robots to be funny, Veale explains, we need to analyze humor computationally. Using artificial intelligence (AI), Veale shows that joke generation is a knowledge-based process—a sense of humor is blend of wit *and* wisdom. He notes that existing technologies can detect sarcasm in conversation, and explains how some jokes can be pre-scripted while others are generated algorithmically—all while making AI accessible and mathematics understandable for the general reader. Of course, there's no single algorithm or technology that we can plug in to make our virtual assistants or GPS voice navigation funny, but Veale provides a computational roadmap for how we might get there.

Tony Veale is Associate Professor of Computer Science at University College Dublin, with a focus on computational creativity. He is the coauthor of *Twitterbots: Making Machines that Make Meaning* (MIT Press).

For fans of computers and comedy alike, an accessible and entertaining look into how we can use artificial intelligence to make smart machines funny.

September
6 x 9, 240 pp.
23 illus.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04599-5

Meaningful Stuff

Design That Lasts

Jonathan Chapman

Never have we wanted, owned, and wasted so much “stuff.” Our consumptive path through modern life leaves a wake of social and ecological destruction—sneakers worn only once, bicycles barely even ridden, and forgotten smartphones languishing in drawers. By what perverse alchemy do our newest, coolest things so readily transform into meaningless junk? In *Meaningful Stuff*, Jonathan Chapman investigates why we throw away things that still work, and shows how we can design products, services, and systems that last.

Obsolescence is an economically driven design decision—a plan to hasten a product’s functional or psychological undesirability. Many electronic devices, for example, are intentionally impossible to dismantle for repair or recycling, their brief use-career proceeding inexorably to a landfill. A sustainable design specialist who serves as a consultant to global businesses and governmental organizations, Chapman calls for the decoupling of economic activity from mindless material consumption and shows how to do it.

Chapman shares his vision for an “experience heavy, material light” design sensibility. This vital and timely new design philosophy reveals how meaning emerges from designed encounters between people and things, explores ways to increase the quality and longevity of our relationships with objects and the systems behind them, and ultimately demonstrates why design can—and must—lead the transition to a sustainable future.

Jonathan Chapman is Professor and Director of Doctoral Studies at Carnegie Mellon University’s School of Design and the author of *Emotionally Durable Design: Objects, Experiences and Empathy*.

“What does it mean to ensure that products last over time when, as happens today, they have to be seen as hybrid, complex and dynamic entities? Jonathan Chapman tells us everything we need to know to answer this question. And to give them a longer life.”

—**Ezio Manzini, DESIS Network; author of *Design, When Everybody Designs and Politics of the Everyday***

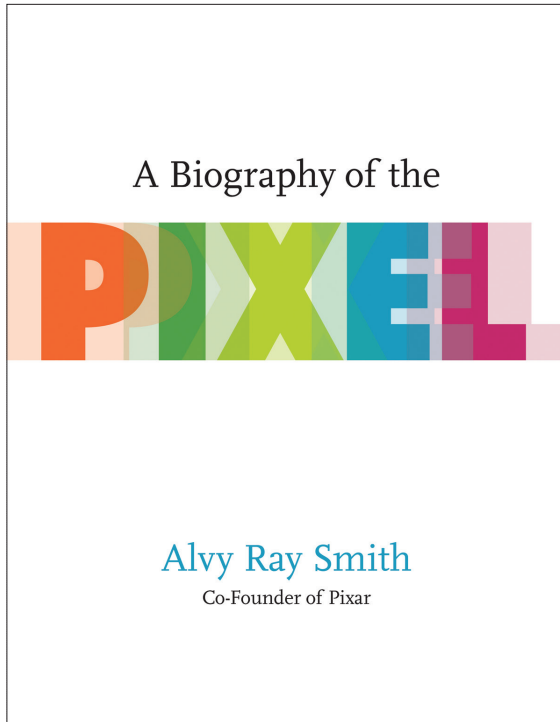


An argument for a design philosophy of better, not more.

August
6 x 9 x 0.6250, 240 pp.

US \$24.95T/\$33.95 CAN cloth
978-0-262-04572-8

Design Thinking, Design Theory series



A Biography of the Pixel

Alvy Ray Smith

cofounder of Pixar

The Great Digital Convergence of all media types into one universal digital medium occurred, with little fanfare, at the recent millennium. The bit became the universal medium, and the pixel—a particular packaging of bits—conquered the world. Henceforward, nearly every picture in the world would be composed of pixels—cell phone pictures, app interfaces, Mars Rover transmissions, book illustrations, videogames. In *A Biography of the Pixel*, Pixar cofounder Alvy Ray Smith argues that the pixel is the organizing principle of most modern media, and he presents a few simple but profound ideas that unify the dazzling varieties of digital image making.

Smith's story of the pixel's development begins with Fourier waves, proceeds through Turing machines, and ends with the first digital movies from Pixar, DreamWorks, and Blue Sky. Today, almost all the pictures we encounter are digital—mediated by the pixel and irretrievably separated from their media; museums and kindergartens are two of the last outposts of the analog. Smith explains, engagingly and accessibly, how pictures composed of invisible stuff become visible—that is, how digital pixels convert to analog display elements. Taking the special case of digital movies to represent all of Digital Light (his term for pictures constructed of pixels), and drawing on his decades of work in the field, Smith approaches his subject from multiple angles—art, technology, entertainment, business, and history. *A Biography of the Pixel* is essential reading for anyone who has watched a video on a cell phone, played a videogame, or seen a movie.

The pixel as the organizing principle of all pictures, from cave paintings to Toy Story.

August
7 x 9, 560 pp.
182 color illus.

US \$39.95T/\$53.95 CAN paper
978-0-262-54245-6

A Leonardo Book

Alvy Ray Smith cofounded Pixar and Altamira Software. He was the first Director of Computer Graphics at Lucasfilm and the first Graphics Fellow at Microsoft. He has received two technical Academy Awards for his contribution to digital moviemaking technology.

“We spend half our day staring at a screen, but where do the images on it come from? This engaging, thoroughly researched book by a pioneer of digital image-making explains the history, theory, and technology of every image you see through a computer screen.”

—**Peter Norvig, Director of Research at Google**

Privacy Is Hard and Seven Other Myths

Achieving Privacy through Careful Design

Jaap-Henk Hoepman

We are tethered to our devices all day, every day, leaving data trails of our searches, posts, clicks, and communications. Meanwhile, governments and businesses collect our data and use it to monitor us without our knowledge. So we have resigned ourselves to the belief that privacy is hard—choosing to believe that websites do not share our information, for example, and declaring that we have nothing to hide, anyway. In this informative and illuminating book, a computer privacy and security expert argues that privacy is not that hard if we build it into the design of systems from the start.

Along the way, Jaap-Henk Hoepman debunks eight persistent myths surrounding computer privacy. The website that claims it doesn't collect personal data, for example; Hoepman explains that most data is personal, capturing location, preferences, and other information. You don't have anything to hide? There's nothing wrong with wanting to keep personal information—even if it's not incriminating or embarrassing—private. Hoepman shows that just as technology can be used to invade our privacy, it can be used to protect it, when we apply privacy by design. Hoepman suggests technical fixes, discussing pseudonyms, leaky design, encryption, metadata, and the benefits of keeping your data local (on your own device only), and outlines privacy design strategies that system designers can apply now.

Jaap-Henk Hoepman is Associate Professor at the Institute for Computing and Information Sciences of the Radboud University Nijmegen, the Netherlands, where he is also a member of iHub, an interdisciplinary research hub on security, privacy, and data governance. He is Associate Professor in the IT Law section of the Transboundary Legal Studies Department of the Faculty of Law at the University of Groningen.

PRIVACY IS HARD

AND SEVEN OTHER MYTHS

ACHIEVING PRIVACY
THROUGH CAREFUL DESIGN



Jaap-Henk Hoepman

An expert on computer privacy and security shows how we can build privacy into the design of systems from the start.

October
6 x 9, 272 pp.
30 illus.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04582-7

Bots and Beasts

What Makes Machines, Animals, and People Smart?

Paul Thagard

Octopuses can open jars to get food, and chimpanzees can plan for the future. An IBM computer named Watson won on *Jeopardy!* and Alexa knows our favorite songs. But do animals and smart machines really have intelligence comparable to that of humans? In *Bots and Beasts*, Paul Thagard looks at how computers (“bots”) and animals measure up to the minds of people, offering the first systematic comparison of intelligence across machines, animals, and humans.

Thagard explains that human intelligence is more than IQ and encompasses such features as problem-solving, decision-making, and creativity. He uses a checklist of twenty characteristics of human intelligence to evaluate the smartest machines—including Watson, AlphaZero, virtual assistants, and self-driving cars—and the most intelligent animals—including octopuses, dogs, dolphins, bees, and chimpanzees. Neither a romantic enthusiast for nonhuman intelligence nor a skeptical killjoy, Thagard offers a clear assessment. He discusses hotly debated issues about animal intelligence concerning bacterial consciousness, fish pain, and dog jealousy. He evaluates the plausibility of achieving human-level artificial intelligence and considers ethical and policy issues. A full appreciation of human minds reveals that current bots and beasts fall far short of human capabilities.

Paul Thagard, a philosopher and cognitive scientist, is Distinguished Professor Emeritus of Philosophy at the University of Waterloo. He is the author of *Brain-Mind*, *Natural Philosophy*, *The Cognitive Science of Science*, *Hot Thought*, *Mind: Introduction to Cognitive Science* (the last three published by the MIT Press), and many other books. He writes a popular blog for *Psychology Today* and can be found at paulthagard.com.

**An expert on mind considers
how animals and smart
machines measure up to
human intelligence.**

October
6 x 9, 304 pp.
25 illus.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04594-0

Born Knowing

Imprinting and the Origins of Knowledge

Giorgio Vallortigara

illustrated by Claudia Losi

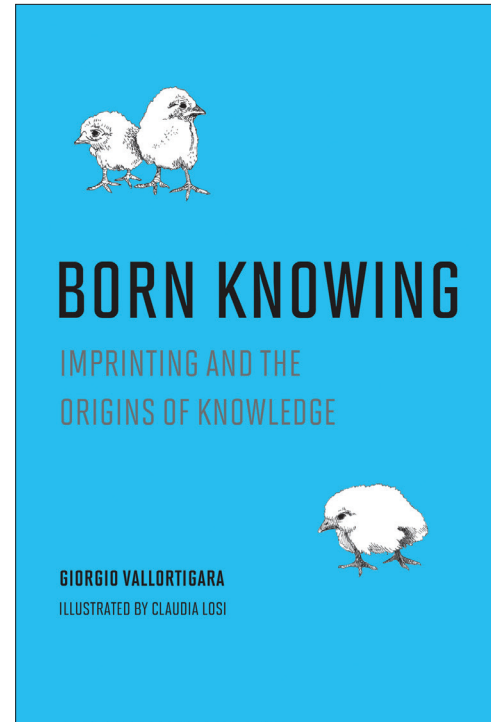
Why do newborns show a preference for a face (or something that resembles a face) to a nonface-like object? Why do baby chicks prefer a moving object to an inanimate one? Neither baby human nor baby chick has had time to learn to like faces or movement. In *Born Knowing*, neuroscientist Giorgio Vallortigara argues that the mind is not a blank slate. Early behavior is biologically predisposed rather than learned, and this instinctive or innate behavior, Vallortigara says, is key to understanding the origins of knowledge.

Drawing on research carried out in his own laboratory over several decades, Vallortigara explores what the imprinting process in young chicks, paralleled by the cognitive feats of human newborns, reveals about minds at the onset of life. He explains that a preference for faces or representations of something face-like and animate objects—predispositions he calls “life detectors”—streamlines learning, allowing minds to avoid a confusing multiplicity of objects in the environment, and he considers the possibility that autism spectrum disorders might be linked to a deficit in the preference for the animate. He also demonstrates that animals do not need language to think, and that addition and subtraction can be performed without numbers. The origin of knowledge, Vallortigara argues, is the wisdom that humans and animals possess as basic brain equipment, the product of natural history rather than individual development.

Giorgio Vallortigara is Professor of Neuroscience and Head of the Animal Brain and Cognition Laboratory at the Centre for Mind/Brain Sciences of the University of Trento, Italy. He is the coauthor of *Divided Brains: The Biology and Behaviour of Brain Asymmetries*.

“Written with compassion and humor, and adorned with delightful and informative illustrations, this book provides insights into the ways in which the mind gains knowledge of the world.”

—**Eva Jablonka, Tel-Aviv University, coauthor of *The Evolution of the Sensitive Soul***



An expert on the brain argues that the mind is not a blank slate and that much early behavior is biologically predisposed rather than learned.

September
5 1/4 x 8, 200 pp.
72 illus.

US \$24.95T/\$33.95 CAN cloth
978-0-262-04593-3



How the internet disrupted the recorded music, newspaper, film, and television industries and what this tells us about surviving technological disruption.

October
6 x 9, 200 pp.
8 illus.

US \$24.95T/\$33.95 CAN cloth
978-0-262-04609-1

Media Disrupted

Surviving Pirates, Cannibals and Streaming Wars

Amanda D. Lotz

Much of what we think we know about how the internet “disrupted” media industries is wrong. Piracy did not wreck the recording industry, Netflix isn’t killing Hollywood movies, and information does not want to be free. In *Media Disrupted*, Amanda Lotz looks at what really happened when the recorded music, newspaper, film, and television industries were the ground zero of digital disruption. It’s not that digital technologies introduced “new media,” Lotz explains; rather, they offered existing media new tools for reaching people.

For example, the MP3 unbundled recorded music; as the internet enabled new ways for people to experience and pay for music, the primary source of revenue for the recorded music industry shifted from selling music to licensing it. Cable television providers, written off as predigital dinosaurs, became the dominant internet service providers. News organizations struggled to remake businesses in the face of steep declines in advertiser spending, while the film industry split its business among movies that compelled people to go to theaters and others that are better suited for streaming. Lotz looks in detail at how and why internet distribution disrupted each industry. The stories of business transformation she tells offer lessons for surviving and even thriving in the face of epoch-making technological change.

Amanda D. Lotz is Professor at the Queensland University of Technology, where she also leads the Transforming Media Industries research project in the Digital Media Research Centre. She is the author of *We Now Disrupt This Broadcast: How Cable Transformed Television and the Internet Revolutionized It All* (MIT Press) and other books. Her articles about the business of television have been published by *Fortune*, *Business Insider*, *Salon*, and *The New Republic*.

Discriminating Data

Correlation, Neighborhoods, and the New Politics of Recognition

Wendy Hui Kyong Chun

In *Discriminating Data*, Wendy Hui Kyong Chun reveals how polarization is a goal—not an error—within Big Data and machine learning. These methods, she argues, encode segregation, eugenics, and identity politics through their default assumptions and conditions. Correlation, which grounds Big Data’s predictive potential, stems from twentieth-century eugenic attempts to “breed” a better future. Recommender systems foster angry clusters of sameness through homophily. Users are “trained” to become authentically predictable via a politics and technology of recognition. Machine learning and data analytics thus seek to disrupt the future by making disruption impossible.

Chun, who has a background in systems design engineering as well as media studies and cultural theory, explains that although machine learning algorithms may not officially include race as a category, they embed whiteness as a default. Facial recognition technology, for example, relies on the faces of Hollywood celebrities and university undergraduates—groups not famous for their diversity. Homophily emerged as a concept to describe white U.S. resident attitudes to living in biracial yet segregated public housing. Predictive policing technology deploys models trained on studies of predominantly underserved neighborhoods. Trained on selected and often discriminatory or dirty data, these algorithms are only validated if they mirror this data.

How can we release ourselves from the vice-like grip of discriminatory data? Chun calls for alternative algorithms, defaults, and interdisciplinary coalitions in order to desegregate networks and foster a more democratic Big Data.

Wendy Hui Kyong Chun is Simon Fraser University’s Canada 150 Research Chair in New Media and Professor of Communication and Director of the SFU Digital Democracies Institute. She is the author of *Control and Freedom*, *Programmed Visions*, and *Updating to Remain the Same*, all published by the MIT Press.



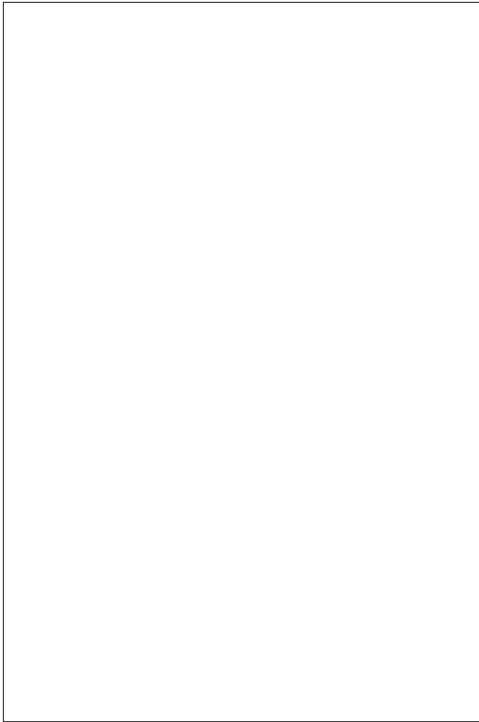
How Big Data and machine learning encode discrimination and create agitated clusters of comforting rage.

November
6 x 9, 312 pp.
69 illus.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04622-0

Also available

Updating to Remain the Same
Wendy Hui Kyong Chun
US \$35.00X/\$47.00 CAN paper
978-0-262-53472-7



How wealthy American women—as consumers and as influencers—helped shape French couture of the late nineteenth century; lavishly illustrated.

October
7 x 9, 280 pp.
71 color illus., 19 b&w illus.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04584-1

Dressing Up

The Women Who Influenced French Fashion

Elizabeth L. Block

French fashion of the late nineteenth century is known for its allure, its ineffable chic—think of John Singer Sargent’s *Madame X* and her scandalously slipping strap. For Parisian couturiers and their American customers, it was also serious business. In *Dressing Up*, Elizabeth Block examines the couturiers’ influential clientele—wealthy American women who bolstered the French fashion industry with a steady stream of orders from the United States. Countering the usual narrative of the designer as solo creative genius, Block shows that these women—as high-volume customers and as pre-Internet influencers—were active participants in the era’s transnational fashion system.

Block describes the arrival of *nouveau riche* Americans on the French fashion scene, joining European royalty, French socialites, and famous actresses on the client rosters of the best fashion houses—Charles Frederick Worth, Doucet, and Félix, among others. She considers the mutual dependence of couture and coiffure; the participation of couturiers in international expositions (with mixed financial results); the distinctive shopping practices of American women, which ranged from extensive transatlantic travel to quick trips downtown to the department store; the performance of conspicuous consumption at balls and soirées; the impact of American tariffs on the French fashion industry; and the emergence of smuggling, theft, and illicit copying of French fashions in the American market as the middle class emulated the preferences of the rich. Lavishly illustrated, with vibrant images of dresses, portraits, and fashion plates, *Dressing Up* reveals the power of American women in French couture.

Winner of the Aileen Ribeiro Grant of the Association of Dress Historians; an Association for Art History grant; and a Pasold Research Fund grant.

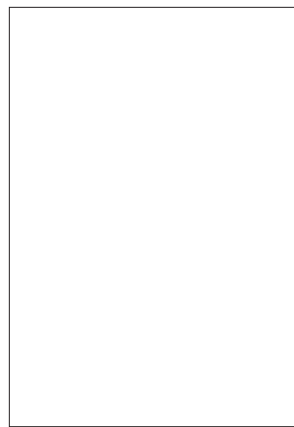
Elizabeth L. Block, an art historian, is Senior Editor in the Publications and Editorial Department at the Metropolitan Museum of Art in New York. She has contributed to publications including *American Art* and *West 86th: A Journal of Decorative Arts, Design History, and Material Culture*.

Paper Graveyards

Eduardo Cadava

A generously illustrated training manual for reading images, discussing work by Félix Nadar, Roland Barthes, Fazal Sheikh, Susan Meiselas, and others.

Paper Graveyards is neither a work of traditional art history nor one of literary criticism. It is not strictly a history of ideas



either, notwithstanding its very obvious erudition. Rather, in drawing upon all of these methods and approaches—and with extraordinary attention to language and style—Cadava’s writing examines the spectacular explosion of images during the last twenty years as a prompt to discuss not simply specific images but the role and place of these images in our everyday life.

Considering work by Félix Nadar, Roland Barthes, Leon Golub, Nancy Spero, Fazal

Sheikh, Susan Meiselas, and others, Cadava delineates different modes of reading that, taking their point of departure from the conviction that the past, the present, and the future are always bound together, provide us with a training manual of sorts for understanding visual material in the twenty-first century. In the process, these generously illustrated essays actively expand our sense of literacy by reconstructing the networks of relations that inhabit the plural worlds of images, and create a critical genealogy of what we still call “an image,” even when, with every day that passes, we perhaps understand less and less what this might mean.

Eduardo Cadava is Professor of English at Princeton University. He is the author of *Words of Light: Theses on the Photography of History* and *Emerson and the Climates of History*. He also has introduced and cotranslated Nadar’s memoir, *Quand j’étais photographe*, published by the MIT Press as *When I Was a Photographer*.

September | 6 x 9, 512 pp. | 88 color illus.

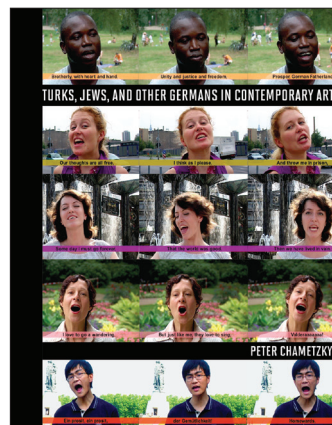
US \$49.95T/\$65.95 CAN cloth
978-0-262-04604-6

Turks, Jews, and Other Germans in Contemporary Art

Peter Chametzky

The first book to examine multicultural visual art in Germany, discussing more than thirty contemporary artists and arguing for a cosmopolitan Germanness.

With *Turks, Jews, and Other Germans in Contemporary Art*, Peter Chametzky presents a view of visual culture in Germany that



leaves behind the usual suspects—those artists who dominate discussions of contemporary German art, including Gerhard Richter, Anselm Kiefer, and Rosemarie Trockel—and instead turns to those artists not as well known outside Germany, including Maziar Moradi, Hito Steyerl, and Tanya Ury. In this first book-length examination of Germany’s multicultural art scene, Chametzky explores the

work of more than thirty German artists who are (among other ethnicities) Turkish, Jewish, Arab, Asian, Iranian, Sinti and Roma, Balkan, and Afro-German.

With a title that echoes Peter Gay’s 1978 collection of essays, *Freud, Jews and Other Germans*, this book, like Gay’s, rejects the idea of “us” and “them” in German culture. Discussing artworks in a variety of media that both critique and expand notions of identity and community, Chametzky offers a counternarrative to the fiction of an exclusively white, Christian German culture, arguing for a cosmopolitan Germanness. He considers works that deploy critical, confrontational, and playful uses of language, especially German and Turkish; that assert the presence of “foreign bodies” among the German body politic; that grapple with food as a cultural marker; that engage with mass media; and that depict and inhabit spaces imbued with the element of time.

Peter Chametzky is Professor of Art History at the School of Visual Art and Design at the University of South Carolina.

September | 7 x 9, 360 pp. | 108 color illus., 17 b&w illus.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04576-6

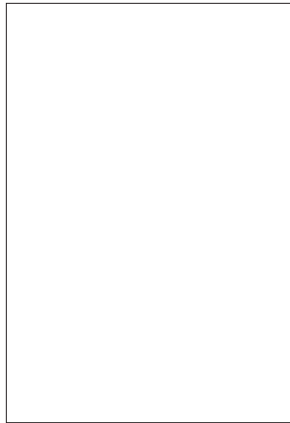
The Body Fantastic

Frank Gonzalez-Crussi

foreword by John Banville

The body in dreams, myths, legends, and anecdotes of the fantastic as expressions of human corporeality.

In *The Body Fantastic*, Frank Gonzalez-Crussi looks at the human body through the lens of dreams, myths, legends, and anecdotes



of the bizarre, exploring the close connection of the fictitious and the fabulous to our conception of the body. He chronicles, among other curious cases, the man who ate everything (including boiled hedgehogs and mice on toast), the therapeutic powers of saliva, hair that burst into flames, and an “amphibian man” who lived under water. Drawing on clinical records, popular lore, and art, history, and literature, Gonzalez-Crussi considers the body in both real and imaginary dimensions.

Myths and stories, Gonzalez-Crussi reminds us, are the symbolic expression of our aspirations and emotions. These fantastic tales of bodies come from the deepest regions of the human psyche. Ancient Greeks, for example, believed that the uterus wandered around inside a woman’s body—an “animal within an animal.” If a woman sniffed an unpleasant odor, the uterus would retreat. Organized “digestive excess” began with the eating and drinking contests of antiquity and continue through the hot-dog eating competitions of today. And the “libido-podalic association,” connecting male sexuality and the foot, insinuated itself into mainstream medicine in the sixteenth century; meanwhile, the feet of women in some cultures were scrupulously kept from view. Gonzalez-Crussi shows that the many imaginary representations of the body are very much a part of our corporeality.

Frank Gonzalez-Crussi is Professor Emeritus in the Department of Pathology of Northwestern University Medical School. He is the author of *On Seeing: Things Seen, Unseen and Obscene*, *Carrying the Heart*, and other books.

August | 5 1/4 x 8, 288 pp. | 16 illus.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04588-9



The first English translation of the book that established Paolo Virno as one of the most influential Italian thinkers of his generation.

August
5 1/4 x 8, 248 pp.

US \$29.95T/\$39.95 CAN cloth
978-0-262-04580-3

Insubordinations: Italian Radical Thought

Convention and Materialism

Uniqueness without Aura

Paolo Virno

foreword by Giorgio Agamben

translated by Lorenzo Chiesa

With the 1986 publication of this book in Italy, Paolo Virno established himself as one of the most influential Italian thinkers of his generation. Astonishingly, this crucial work has never before been published in an English translation. This MIT Press edition, translated by Italian philosopher and Insubordinations series editor Lorenzo Chiesa, is its first English-language version. Virno here engages, in an innovative and iconoclastic way, with some classical questions of philosophy, including experience, singularity, and the relation between ethics and language, while also offering a profoundly transformative political perspective that revolves around the Marxian notion of the “general intellect.”

Virno reconsiders Walter Benjamin’s idea of a “loss of the aura” (brought on, Benjamin argued, by technical reproducibility), and postulates instead the existence of a new experience of uniqueness that, although deprived of every metaphysical aura, resides in the very process of late-capitalist serial reproduction. Writing after the defeat of contemporary leftist revolutionary movements in the West, Virno argues for the possibility of a “good life” originating immanently from existential and political crises. With speculative detours through the thought of philosophers ranging from Aquinas and Berkeley to Heidegger and Wittgenstein, with a specific focus on Kant and Hegel, Virno shows how a renewed reflection on basic theoretical problems helps us to better grasp what is happening now. This edition features a preface written by Virno in 2011.

Paolo Virno is an Italian philosopher, semiologist, and activist. A prominent figure among the Italian workerist thinkers, he teaches at the University of Rome and is the author of *A Grammar of the Multitude* and *Multitude between Innovation and Negation*, both published in English by Semiotext(e).

“Paolo Virno is unquestionably one of the most consistently innovative, radical, and insightful thinkers working in Italy today. This deft translation of his first book demonstrates that Virno is a philosopher capable of that rarest of feats—combining an innovative and iconoclastic engagement with the classical questions of philosophy (from truth to happiness, materialism to human nature), with a profoundly transformative political perspective.”

—**Alberto Toscano, Reader in Critical Theory, Goldsmiths, University of London, and Visiting Associate Professor, Simon Fraser University**

Stories from Architecture

Behind the Lines at Drawing Matter

Philippa Lewis

foreword by Adrian Forty

The imagined histories of twenty-five architectural drawings and models, told through reminiscences, stories, conversations, letters, and monologues.

Even when an architectural drawing does not show any human figures, we can imagine many different characters just off the



page: architects, artists, onlookers, clients, builders, developers, philanthropists—working, observing, admiring, arguing. In *Stories from Architecture*, Philippa Lewis captures some of these personalities through reminiscences, anecdotes, conversations, letters, and monologues that collectively offer the imagined histories of twenty-five architectural drawings.

Some of these untold stories are factual, like Frank Lloyd Wright's correspondence with a Wisconsin librarian

regarding her \$5,000 dream home, or letters written by the English architect John Nash to his irascible aristocratic client. Others recount a fictional scenario. For instance, the dilemma facing a Regency couple who are considering a move to a suburban villa; a teenager dreaming of a life away from parental supervision by gazing at a gadget-filled bachelor pad in *Playboy* magazine; and a policeman recording the ground plans of the house of a murder scene.

The drawings, reproduced in color, are all sourced from the Drawing Matter collection in Somerset, UK, and are fascinating objects in themselves; but Lewis shifts our attention beyond the image to other possible histories that linger, invisible, beyond the page, and in the process animates not just a series of archival documents but the writing of architectural history.

Philippa Lewis is a writer, photographer, and picture editor. She is the author of *A Dictionary of Ornament* (with Gillian Darley); *Details: A Guide to House Design in Britain*; *Everything You Can Do in the Garden without Actually Gardening*; *Everyman's Castle*; and other books.

October | 6 x 9, 200 pp. | 60 color illus., 17 b&w illus.

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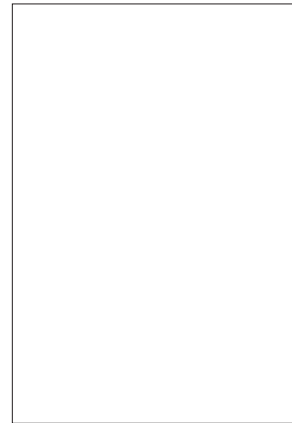
Formulations

Architecture, Mathematics, and Culture

Andrew Witt

An investigation of mathematics as it was drawn, encoded, imagined, and interpreted by architects on the eve of digitization in the mid-twentieth century.

In *Formulations*, Andrew Witt examines the visual, methodological, and cultural intersections between architecture and



mathematics. The linkages Witt explores involve not the mystic transcendence of numbers invoked throughout architectural history, but rather architecture's encounters with a range of calculational systems—techniques that architects inventively retooled for design. Witt offers a catalog of mid-twentieth-century practices of mathematical drawing and calculation in design that preceded and anticipated digitization as well as an account of the formal compendia that became a

cultural currency shared between modern mathematicians and modern architects.

Witt presents a series of extensively illustrated “biographies of method”—episodes that chart the myriad ways in which mathematics, particularly the mathematical notion of modeling and drawing, was spliced into the creative practice of design. These include early drawing machines that mechanized curvature; the virtualization of buildings and landscapes through surveyed triangulation and photogrammetry; stereoscopic drawing; the economic implications of cubic matrices; and a strange synthesis of the technological, mineral, and biological: crystallographic design.

Trained in both architecture and mathematics, Witt uses mathematics as a lens through which to understand the relationship between architecture and a much broader set of sciences and visual techniques. Through an intercultural exchange with other disciplines, he argues, architecture adapted not only the shapes and surfaces of mathematics but also its values and epistemic ideals.

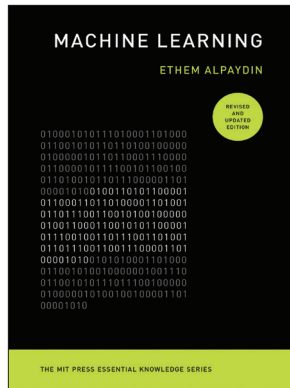
Andrew Witt is Associate Professor in Practice of Architecture at Harvard University Graduate School of Design and cofounder of Certain Measures, a design and technology studio based in Berlin and Boston.

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Ethem Alpaydin is Professor in the Department of Computer Engineering at Özyegin University and a member of the Science Academy, Istanbul. He is the author of the widely used textbook, *Introduction to Machine Learning* (MIT Press), now in its fourth edition.

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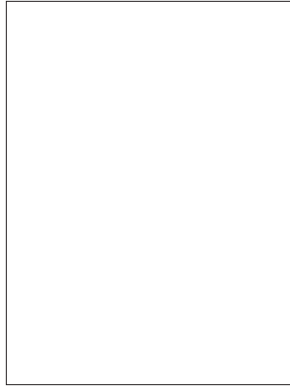
An examination of the contemporary medicalization of death and dying that calls us to acknowledge instead death's existential and emotional realities.

Nicole M. Piemonte, PhD, is Assistant Dean for Medical Education at Creighton University School of Medicine in Phoenix. She is the author of *Afflicted: How Vulnerability Can Heal Medical Education and Practice* (MIT Press). **Shawn Abreu**, MD, is a board-certified Hospice and Palliative Medicine physician at Hospice of the Valley in Phoenix.

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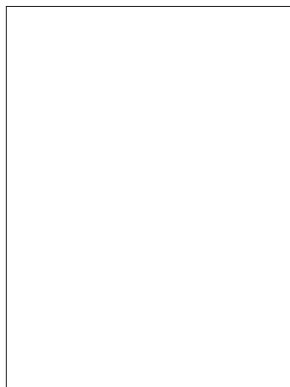
An accessible explanation of the technologies that enable such popular voice-interactive applications as Alexa, Siri, and Google Assistant.

Roberto Pieraccini, an expert in spoken human-machine interaction, is Director of Engineering at Google. He is the author of *The Voice in the Machine: Building Computers That Understand Speech*.

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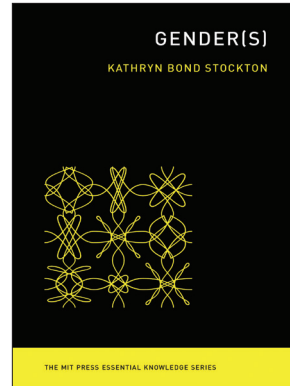
How biofabricated materials and machines powered by living biological cells can tackle technological challenges in medicine, agriculture, and global security.

Ritu Raman, an engineer, writer, and educator, has been named to the *Forbes* 30 Under 30 Science list and the *MIT Technology Review* 35 Innovators Under 35 list. She is a Postdoctoral Fellow at MIT.

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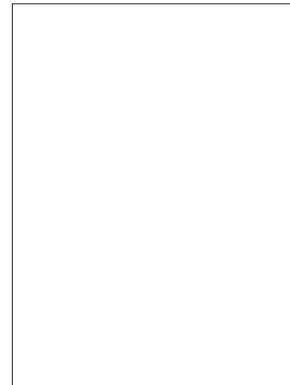
Why gender is strange, even when it's played straight, and how race and money are two of its most dramatic ingredients.

Kathryn Bond Stockton is Distinguished Professor of English and inaugural Dean of the School for Cultural and Social Transformation at the University of Utah. She is the author of *Beautiful Bottom*, *Beautiful Shame: Where "Black" Meets "Queer,"* *The Queer Child*, or *Growing Sideways in the Twentieth Century* (both finalists for the Lambda Literary Award in LGBT Studies), and *Making Out* (finalist for the Next Generation Indie Book Award for memoir), among other books.

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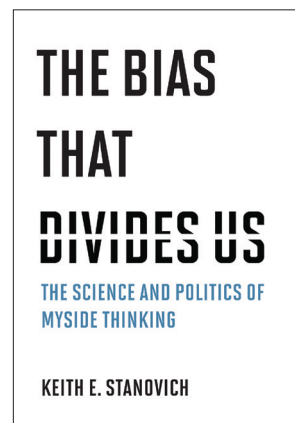
The Bias That Divides Us

The Science and Politics of Myside Thinking

Keith E. Stanovich

Why we don't live in a post-truth society but rather a myside society: what science tells us about the bias that poisons our politics.

In *The Bias That Divides Us*, psychologist Keith Stanovich argues provocatively that we don't live in a *post-truth* society, as has



been claimed, but rather a *myside* society. Our problem is not that we are unable to value and respect truth and facts, but that we are unable to agree on commonly accepted truth and facts. We believe that our side knows the truth. Post-truth? That describes the other side. The inevitable result is political polarization. Stanovich shows what science can tell us about myside bias: how common it is, how to avoid it, and what purposes it serves.

Stanovich explains that although myside bias is ubiquitous, it is an outlier among cognitive biases. It is unpredictable. Intelligence does not inoculate against it, and myside bias in one domain is not a good indicator of bias shown in any other domain. Stanovich argues that because of its outlier status, myside bias creates a true blind spot among the cognitive elite—those who are high in intelligence, executive functioning, or other valued psychological dispositions. They may consider themselves unbiased and purely rational in their thinking, but in fact they are just as biased as everyone else. Stanovich investigates how this bias blind spot contributes to our current ideologically polarized politics, connecting it to another recent trend: the decline of trust in university research as a disinterested arbiter.

Keith E. Stanovich is Professor Emeritus of Applied Psychology and Human Development at the University of Toronto. He is the author of *What Intelligence Tests Miss*, for which he received the 2010 Grawemeyer Award in Education, and coauthor of *The Rationality Quotient: Toward a Test of Rational Thinking* (MIT Press). He received 2012 E. L. Thorndike Career Achievement Award from the American Psychological Association. He lives in Portland, Oregon.

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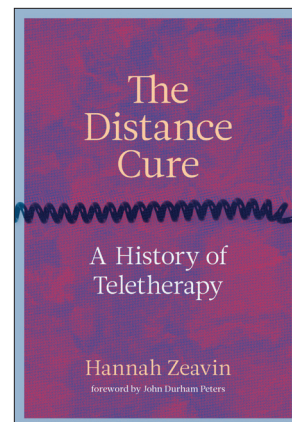
information science | psychology

The Distance Cure

Hannah Zeavin

Psychotherapy across distance and time, from Freud's treatments by mail to crisis hotlines, radio call-ins, chatbots, and Zoom sessions.

Therapy has long understood itself as taking place in a room, with two (or sometimes more) people engaged in person-to-



person conversation. And yet, starting with Freud's treatments by mail, psychotherapy has operated through multiple communication technologies and media. These have included advice columns, radio broadcasts, crisis hotlines, video, personal computers, and mobile phones; the therapists (broadly defined) can be professional or untrained, strangers or chatbots. In *The Distance Cure*, Hannah Zeavin proposes a reconfiguration of the traditional therapeutic dyad of

therapist and patient as a therapeutic triad: therapist, patient, and communication technology.

Zeavin tracks the history of teletherapy (understood as a therapeutic interaction over distance) and its metamorphosis from a model of cure to one of contingent help, describing its initial use in ongoing care, its role in crisis intervention and symptom management, and our pandemic-mandated reliance on regular Zoom sessions. Her account of the “distanced intimacy” of the therapeutic relationship offers a powerful rejoinder to the notion that contact across distance (or screens) is automatically lesser, or useless, to the person seeking therapeutic treatment or connection. At the same time, these modes of care can quickly become a backdoor for surveillance and disrupt ethical standards important to the therapeutic relationship. The history of the conventional therapeutic scenario cannot be told in isolation from its shadow form, teletherapy. Therapy, Zeavin tells us, was never just a “talking cure”; it has always been a *communication* cure.

Hannah Zeavin is a Lecturer in the Departments of English and History at the University of California, Berkeley, and is affiliated with the University of California, Berkeley, Center for Science, Technology, Medicine, and Society.

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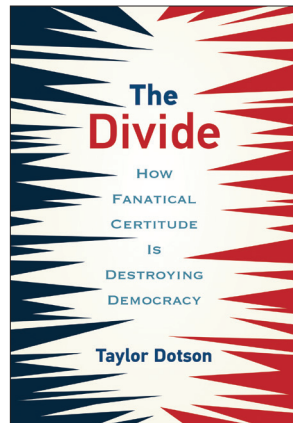
The Divide

How Fanatical Certitude Is Destroying Democracy

Taylor Dotson

Why our obsession with truth—the idea that some undeniable truth will make politics unnecessary—is driving our political polarization.

In *The Divide*, Taylor Dotson argues provocatively that what drives political polarization is not our disregard for facts in a post-truth era, but rather our obsession with truth. The idea that some undeniable truth will make politics unnecessary, Dotson says, is damaging democracy. We think that appealing to facts, or common sense, or nature, or the market will resolve political disputes. We view our opponents as ignorant, corrupt, or brainwashed. Dotson argues that we don't need to agree with everyone, or force everyone to agree with us; we just need to be civil enough to practice effective politics.



Dotson shows that we are misguided to pine for a lost age of respect for expertise. For one thing, such an age never happened. For another, people cannot be made into ultra-rational Vulcans. Dotson offers a road map to guide both citizens and policy makers in rethinking and refashioning political interactions to be more productive. To avoid the trap of divisive and fanatical certitude, we must stop idealizing expert knowledge and romanticizing common sense. He outlines strategies for making political disputes more productive: admitting uncertainty, sharing experiences, and tolerating and negotiating disagreement. He suggests reforms to political practices and processes, adjustments to media systems, and dramatic changes to schooling, childhood, the workplace, and other institutions. Productive and intelligent politics is not a product of embracing truth, Dotson argues, but of adopting a pluralistic democratic process.

Taylor Dotson is Associate Professor of Social Science at New Mexico Institute of Mining and Technology and the author of *Technically Together: Reconstructing Community in a Networked World* (MIT Press).

August | 6 x 9, 232 pp.

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Against Reduction

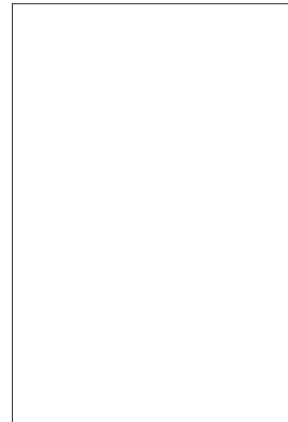
Designing a Human Future with Machines

Noelani Arista, Sasha Costanza-Chock, Vafa Ghazavi, Suzanne Kite, Cathryn Klusmeier, Jason Edward Lewis, Archer Pechawis, Jaclyn Sawyer, Gary Zhexi Zhang, and Snoweria Zhang

introduction by Kate Darling

Provocative, hopeful essays imagine a future that is not reduced to algorithms.

What is human flourishing in an age of machine intelligence, when many claim that the world's most complex problems can



be reduced to narrow technical questions? Does more computing make us more intelligent, or simply more computationally powerful? We need not always resist reduction; our ability to simplify helps us interpret complicated situations. The trick is to know when and how to do so. *Against Reduction* offers a collection of provocative and illuminating essays that consider different ways of recognizing and addressing the reduction in our approach to artificial intel-

ligence, and ultimately to ourselves.

Inspired by a widely read manifesto by Joi Ito that called for embracing the diversity and irreducibility of the world, these essays offer persuasive and compelling variations on resisting reduction. Among other things, the writers draw on indigenous epistemology to argue for an extended “circle of relationships” that includes the nonhuman and robotic; cast “Snow White” as a tale of AI featuring a smart mirror; point out the cismativity of security protocol algorithms; map the interconnecting networks of so-called noncommunicable disease; and consider the limits of moral mathematics. Taken together, they show that we should push back against some of the reduction around us and do whatever is in our power to work toward broader solutions.

October | 5 1/4 x 8, 184 pp. | 3 illus.

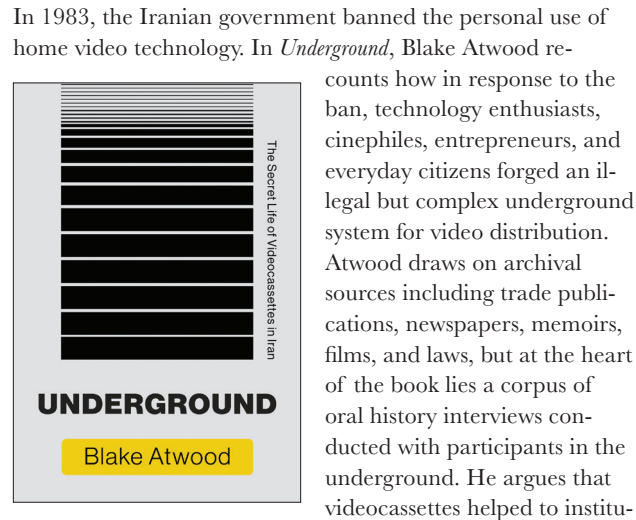
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Underground

The Secret Life of Videocassettes in Iran

Blake Atwood

How Iranians forged a vibrant, informal video distribution infrastructure when their government banned all home video technology in 1983.



In 1983, the Iranian government banned the personal use of home video technology. In *Underground*, Blake Atwood

counts how in response to the ban, technology enthusiasts, cinephiles, entrepreneurs, and everyday citizens forged an illegal but complex underground system for video distribution. Atwood draws on archival sources including trade publications, newspapers, memoirs, films, and laws, but at the heart of the book lies a corpus of oral history interviews conducted with participants in the underground. He argues that videocassettes helped to institutionalize the broader underground within the Islamic Republic. As Atwood shows, the videocassette underground reveals a great deal about how people construct vibrant cultures beneath repressive institutions. It was not just that Iranians gained access to banned movies, but rather that they established routes, acquired technical knowledge, broke the law, and created rituals by passing and trading plastic videocassettes. As material objects, the videocassettes were a means of negotiating the power of the state and the agency of its citizens. By the time the Ministry of Culture and Islamic Guidance lifted the ban in 1994, millions of videocassettes were circulating efficiently and widely throughout the country. The very presence of a video underground signaled the failure of state policy to regulate media. Embedded in the informal infrastructure—even in the videocassettes themselves—was the triumph of everyday people over the state.

Blake Atwood is Associate Professor of Media Studies at the American University of Beirut and the author of *Reform Cinema in Iran: Film and Political Change in the Islamic Republic*.

September | 6 x 9, 264 pp. | 18 illus.

US \$35.00X/\$47.00 CAN paper
978-0-262-54284-5

Infrastructures series

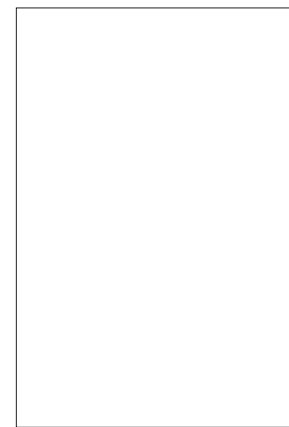
Reality Media

Augmented and Virtual Reality

Jay David Bolter, Maria Engberg, and Blair MacIntyre

How augmented reality and virtual reality are taking their places in contemporary media culture alongside film and television.

This book positions augmented reality (AR) and virtual reality (VR) firmly in contemporary media culture. The authors view



AR and VR not as the latest hyped technologies but as media—the latest in a series of what they term “reality media,” taking their places alongside film and television. Reality media inserts a layer of media between us and our perception of the world; AR and VR do not replace reality but refashion a reality for us. Each reality medium mediates and remediates; each offers a new representation that we implicitly compare to our experience

of the world in itself but also through other media.

The authors show that as forms of reality media emerge, they not only chart a future path for media culture, but also redefine media past. With AR and VR in mind, then, we can recognize their precursors in eighteenth-century panoramas and the Broadway lights of the 1930s. A digital version of *Reality Media*, available through the book’s website, invites readers to visit a series of virtual rooms featuring interactivity, 3-D models, videos, images, and texts that explore the themes of the book.

Jay David Bolter is James and Mary Wesley Chair in New Media at the Georgia Institute of Technology. **Maria Engberg** is Associate Professor in the Department of Computer Science and Media Technology at Malmö University. **Blair MacIntyre** is Professor at Georgia Institute of Technology. MacIntyre and Bolter are codirectors of the Augmented Environments Lab at the Georgia Institute of Technology, where Engberg is Affiliate Researcher.

October | 6 x 9, 248 pp. | 56 illus.

US \$30.00X/\$40.00 CAN cloth
978-0-262-04512-4

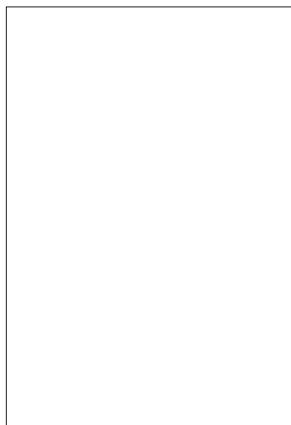
Acquired Tastes

Stories about the Origins of Modern Food

edited by Benjamin Cohen, Michael S. Kideckel,
and Anna Zeide

How modern food helped make modern society between 1870 and 1930: stories of power and food, from bananas and beer to bread and fake meat.

The modern way of eating—our taste for food that is processed, packaged, and advertised—has its roots as far back as the 1870s.



Many food writers trace our eating habits to World War II, but this book shows that our current food system began to coalesce much earlier. Modern food came from and helped to create a society based on racial hierarchies, colonization, and global integration. *Acquired Tastes* explores these themes through a series of moments in food history—stories of bread, beer, sugar, canned food, cereal, bananas, and more—that shaped how we think about food today.

Contributors consider the displacement of native peoples for agricultural development; the invention of Pilsner, the first international beer style; the “long con” of gilded sugar and corn syrup; Josephine Baker’s banana skirt and the rise of celebrity tastemakers; and faith in institutions and experts who produced, among other things, food rankings and fake meat.

Benjamin R. Cohen is Associate Professor at Lafayette College and the author of *Pure Adulteration: Cheating on Nature in the Age of Manufactured Food*.

Michael S. Kideckel teaches history at Princeton Day School and is the author of a forthcoming book, tentatively titled *Fresh from the Factory: Breakfast Cereal, Natural Food, and the Marketing of Reform, 1890–1920*. **Anna Zeide** is Associate Professor of History and Director of Food Studies at Virginia Tech and the author of *Canned: The Rise and Fall of Consumer Confidence in the American Food Industry*.

August | 6 x 9, 290 pp. | 15 illus.

US \$35.00X/\$47.00 CAN paper

978-0-262-54291-3

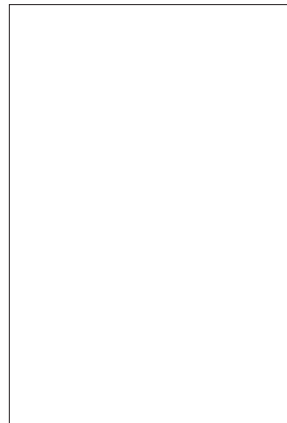
Food, Health, and the Environment series

The Typographic Medium

Kate Brideau

An innovative examination of typography as a medium of communication rather than part of print or digital media.

Typography is everywhere and yet widely overlooked. When we read type, we fail to see type. In this book, Kate Brideau



considers typography not as part of “print media” or “digital media” but as a medium of communication itself, able to transcend the life and death of particular technologies. Examining the contradiction between typographic form (often overlooked) and function (often overpowering), Brideau argues that typography is made up not of letters but of shapes, and that shape is existentially and technologically central to the typographic medium.

After considering what constitutes typographic form, Brideau turns to typographic function and how it relates to form. Examining typography’s role in both the neurological and psychological aspects of reading, she argues that typography’s functions exceed reading; typographic forms communicate, but that communication is not limited to the content they carry. To understand to what extent the design and operations of the typographic medium affect the way we perceive information, Brideau warns, we must understand the medium’s own operational logic, embodied in the full diversity of typographic forms.

Brideau discusses a range of topics—from intellectual property protection for typefaces to Renaissance and Enlightenment ideal letterforms—and draws on a wide variety of theoretical work, including phenomenological ideas about comprehension, German media archaeology, and the media and communication theories of Vilém Flusser and others. Hand-drawn illustrations of typographic forms accompany the text.

Kate Brideau is an adjunct faculty member at in Media, Culture, and Communications at NYU’s Steinhardt School of Culture, Education, and Human Development and in Management Communication at NYU’s Stern School of Business.

October | 6 x 9, 432 pp. | 179 illus.

US \$45.00X/\$60.00 CAN cloth

978-0-262-04585-8

History and Foundations of Information Science series

The Evidence Liberal Arts Needs

Lives of Consequence, Inquiry, and Accomplishment

Richard A. Detweiler

Empirical evidence for the value of a liberal arts education: how and why it has a lasting impact on success, leadership, altruism, learning, and fulfillment.

In ongoing debates over the value of a college education, the role of the liberal arts in higher education has been blamed by some for making college expensive, impractical, and even worthless. Defenders argue that liberal arts education makes society innovative, creative, and civic-minded. But these qualities are hard to quantify, and many critics of higher education call for courses of study to be strictly job-specific. In this groundbreaking book, Richard Detweiler, drawing on interviews with more than 1,000 college graduates aged 25 to 65, offers empirical evidence for the value of a liberal

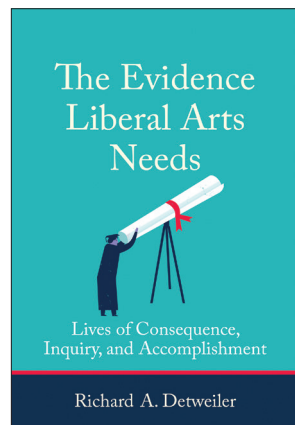
arts education. Detweiler finds that a liberal arts education has a lasting impact on success, leadership, altruism, learning, and fulfillment over a lifetime.

Unlike other defenders of a liberal arts education, Detweiler doesn't rely on philosophical arguments or anecdotes but on data. He developed a series of interview questions related to the *content attributes* of liberal arts (for example, course assignments and majors), the *context attributes* (out-of-class interaction with faculty and students, teaching methods, campus life), and the *purpose attributes* (adult life outcomes). Interview responses show that although both the content of study and the educational context are associated with significant life outcomes, the content of study has less relationship to positive adult life outcomes than the educational context.

Richard A. Detweiler is President Emeritus of the Great Lakes Colleges Association and Founder and Managing Director of Higher Ed Impact.

November | 6 x 9, 280 pp. | 58 illus.

US \$30.00X/\$40.00 CAN paper
978-0-262-54310-1



The Resistance Dilemma

Place-Based Movements and the Climate Crisis

George Hoberg

How organized resistance to new fossil fuel infrastructure became a political force, and how this might affect the transition to renewable energy.

Organized resistance to new fossil fuel infrastructure, particularly conflicts over pipelines, has become a formidable political force in North America. In this book, George Hoberg examines whether such place-based environmental movements are effective ways of promoting climate action, if they might feed resistance to the development of renewable energy infrastructures, and what other, more innovative processes of decision-making would encourage the acceptance of clean energy systems. Focusing on a series of conflicts over new oil sands pipelines, Hoberg investigates activists' strategy of blocking fossil fuel infrastructure, often in alliance with Indigenous groups, and examines the political and environmental outcomes of these actions.

After discussing the oil sands policy regime and the relevant political institutions in Canada and the United States, Hoberg analyzes in detail four anti-pipeline campaigns, examining the controversies over the Keystone XL, the most well-known of these movements and the first one to use infrastructure resistance as a core strategy; the Northern Gateway pipeline; the Trans Mountain pipeline; and the Energy East pipeline. He then considers the "resistance dilemma": the potential of place-based activism to threaten the much-needed transition to renewable energy. He examines several episodes of resistance to clean energy infrastructure in eastern Canada and the United States. Finally, Hoberg describes some innovative processes of energy decision making, including strategic environment assessment, and cumulative impact assessment, looking at cases in British Columbia and Lower Alberta.

George Hoberg is Professor at the School of Public Policy and Global Affairs (SPPGA), University of British Columbia.

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

US \$40.00X/\$54.00 CAN paper
978-0-262-54308-8

American and Comparative Environmental Policy series

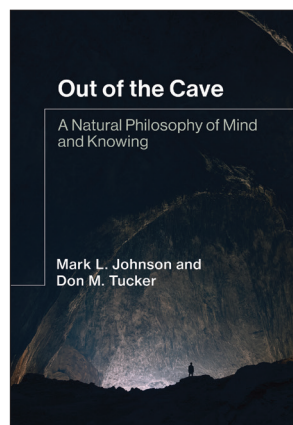
Out of the Cave

A Natural Philosophy of Mind and Knowing

Mark L. Johnson and Don M. Tucker

From a philosopher and a neuropsychologist, a radical rethinking of certain traditional views about human cognition and behavior.

Plato's Allegory of the Cave trapped us in the illusion that mind is separate from body and from the natural and physical



world. Knowledge had to be eternal and absolute. Recent scientific advances, however, show that our bodies shape mind, thought, and language in a deep and pervasive way. In *Out of the Cave*, Mark Johnson and Don Tucker—a philosopher and a neuropsychologist—propose a radical rethinking of certain traditional views about human cognition and behavior. They argue for a theory of knowing as embodied, embedded, enactive, and emotionally based. Knowing is an ongoing

process—shaped by our deepest biological and cultural values.

Johnson and Tucker describe a natural philosophy of mind that is emerging through the convergence of biology, psychology, computer science, and philosophy, and they explain recent research showing that all of our higher-level cognitive activities are rooted in our bodies through processes of perception, motive control of action, and feeling. This developing natural philosophy of mind offers a psychological, philosophical, and neuroscientific account that is at once scientifically valid and subjectively meaningful—allowing us to know both ourselves and the world.

Mark Johnson is Professor of Philosophy and Philip H. Knight Professor of Liberal Arts and Sciences, Emeritus, at the University of Oregon. He is most recently the author of *Embodied Mind, Meaning, and Reason* as well as *The Aesthetics of Meaning and Thought* and other books. **Don M. Tucker** is Professor of Psychology and Director of the Neuroinformatics Center at the University of Oregon. Inventor of the geodesic sensor net, he is CEO and Senior Scientist at Brain Electrophysiology Laboratory Company.

August | 6 x 9 x 0.8125, 344 pp. | 12 illus.

US \$40.00X/\$54.00 CAN cloth
978-0-262-04621-3

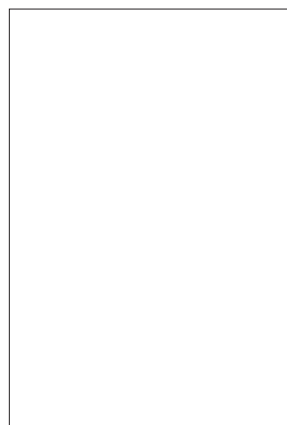
Dubcon

Fanfiction, Power, and Sexual Consent

Milena Popova

How the treatment of sexual consent in erotic fanfiction functions as a form of cultural activism.

Sexual consent is—at best—a contested topic in Western societies and cultures. The #MeToo movement has brought public



attention to issues of sexual consent, revealing the endemic nature of sexual violence. Feminist academic approaches to sexual violence and consent are diverse and multidisciplinary—and yet consent itself is significantly undertheorized. In *Dubcon*, Milena Popova points to a community that has been considering issues of sex, power, and consent for many years: writers and readers of fanfiction. Their nuanced engagement with sexual consent, Popova argues, can shed light

on these issues in ways not available to either academia or journalism.

Popova explains that the term “dubcon” (short for “dubious consent”) was coined by the fanfiction community to make visible the gray areas between rape and consent—for example, in situations where the distribution of power may limit an individual’s ability to give meaningful consent to sex. Popova offers a close reading of three fanfiction stories in the Omega-verse genre, examines the “arranged marriage” trope, and discusses the fanfiction community’s response when a sports star who was a leading character in RPF (real person fiction) was accused of rape. Proposing that fanfiction offers a powerful discursive resistance on issues of rape and consent that challenges dominant discourses about gender, romance, sexuality, and consent, Popova shows that fanfiction functions as a form of cultural activism.

Milena Popova is an independent scholar, activist, and consultant working on culture and sexual consent and the author of *Sexual Consent*, a volume in the MIT Press Essential Knowledge series.

October | 6 x 9, 224 pp. | 1 illus.

US \$30.00X/\$40.00 CAN cloth
978-0-262-04596-4

Form and Flow

The Spatial Politics of Urban Resilience
and Climate Justice

Kian Goh

An examination of urban climate change response strategies and the resistance to them by grassroots activists and social movements.

Cities around the world are formulating plans to respond to climate change and adapt to its impact. Often, marginalized urban residents resist these plans, offering “counterplans” to protest unjust and exclusionary actions. In this book, Kian Goh examines climate change response strategies in three cities—New York, Jakarta, and Rotterdam—and the mobilization of community groups to fight the perceived injustices and oversights of these plans. Looking through the lenses of urban design and socioecological spatial politics, Goh reveals how contested visions of the future city are produced and gain power.

Goh describes, on the one hand, a growing global network of urban environmental planning organizations intertwined with capitalist urban development, and, on the other, social movements that themselves often harness the power of networks. She explores such initiatives as Rebuild By Design in New York, the Giant Sea Wall plan in Jakarta, and Rotterdam Climate Proof, and discovers competing narratives, including community resiliency in Brooklyn and grassroots activism in the informal “kampungs” of Jakarta. Drawing on participatory fieldwork and her own background in architecture and urban design, Goh offers both theoretical explanations and practical planning and design strategies. She reframes the critical concerns of urban climate change responses, presenting a sociospatial typology of urban adaptation and considering the notion of a “just” resilience. Finally, she proposes a theoretical framework for designing equitable and just urban climate futures.

Kian Goh is Assistant Professor of Urban Planning in the Luskin School of Public Affairs at the University of California, Los Angeles.

August | 6 x 9, 296 pp. | 55 illus.

US \$35.00X/\$47.00 CAN paper

978-0-262-54305-7

Urban and Industrial Environments series

Art in the Age of Machine Learning

Sofian Audry

foreword by Yoshua Bengio

An examination of the use of machine learning in new media art that offers conceptual and practical tools for new media artists and theorists.

Over the past decade, an artistic movement has emerged that draws on machine learning as both inspiration and medium. In this book, transdisciplinary artist-researcher Sofian Audry examines artistic practices at the intersection of machine learning and new media art, providing conceptual and practical tools for new media artists and theorists. Audry looks at works from a broad range of practices, including new media installation, robotic art, visual art, electronic music and sound, and electronic literature, connecting machine learning art to such earlier artistic practices as cybernetics art, artificial life art, and evolutionary art.

Machine learning underlies computational systems that are biologically inspired, statistically driven, agent-based networked entities that program themselves. Audry explains the fundamental design of machine learning algorithmic structures in terms accessible to the nonspecialist while framing these technologies within larger historical and conceptual spaces. Audry debunks myths about machine learning art, including the ideas that machine learning can create art without artists and that machine learning will soon bring about superhuman intelligence and creativity. Audry considers learning procedures, describing how artists hijack the training process by playing with evaluative functions; discusses trainable machines and models, explaining how different types of machine learning systems enable different kinds of artistic practices; and reviews the role of data in machine learning art, showing how artists use data as a raw material to steer learning systems and arguing that machine learning allows for novel forms of algorithmic remixes.

Sofian Audry is an artist, scholar, and Professor of Interactive Media within the School of Media at Université du Québec à Montréal.

October | 7 x 10, 256 pp. | 40 illus.

US \$45.00X/\$60.00 CAN cloth

978-0-262-04618-3

A Leonardo Book

art | new media | technology

Giving Bodies Back to Data

Image-Makers, Bricolage, and Reinvention in Magnetic Resonance Technology

Silvia Casini

An examination of the bodily, situated aspects of data-visualization work, looking at visualization practices around the development of MRI technology.

Our bodies are scanned, probed, imaged, sampled, and transformed into data by clinicians and technologists. In this book, Silvia Casini reveals the affective relations and materiality that turn data into image—and in so doing, gives bodies back to data. Opening the black box of MRI technology, Casini examines the bodily, situated aspects of visualization practices around the development of this technology. Reframing existing narratives of biomedical innovation, she emphasizes the important but often overlooked roles played by aesthetics, affectivity, and craft practice in medical visualization.

Combining history, theory, laboratory ethnography, archival research, and collaborative art–science, Casini retrieves the multiple presences and agencies of bodies in data visualization, mapping the traces of scientists’ body work and embodied imagination. She presents an in-depth ethnographic study of MRI development at the University of Aberdeen’s biomedical physics laboratory, from the construction of the first whole-body scanner for clinical purposes through the evolution of the FFC-MRI. Going beyond her original focus on MRI, she analyzes a selection of neuroscience- or biomedicine-inspired interventions by artists in media ranging from sculpture to virtual reality. Finally, she presents a methodology for designing and carrying out small-scale art–science projects, describing a collaboration that she herself arranged, highlighting the relational and aesthetic-laden character of data that are the product of craftsmanship and affective labor at the laboratory bench.

Silvia Casini is Lecturer in Film and Visual Culture at the University of Aberdeen. Her work has appeared in such journals as *Configurations*, *Leonardo*, and *Contemporary Aesthetics*.

August | 7 x 10, 312 pp. | 14 color plates, 70 b&w illus.,

US \$45.00X/\$60.00 CAN cloth
978-0-262-04529-2

A Leonardo Book

bioethics | philosophy

Good Ethics and Bad Choices

The Relevance of Behavioral Economics for Medical Ethics

Jennifer S. Blumenthal-Barby

An analysis of how findings in behavioral economics challenge fundamental assumptions of medical ethics, integrating the latest research in both fields.

Bioethicists have long argued for rational persuasion to help patients with medical decisions. But the findings of behavioral economics—popularized in Thaler and Sunstein’s *Nudge* and other books—show that arguments depending on rational thinking are unlikely to be successful and even that the idea of purely rational persuasion may be a fiction. In *Good Ethics and Bad Choices*, Jennifer Blumenthal-Barby examines how behavioral economics challenges some of the most fundamental tenets of medical ethics. She not only integrates the latest research from both fields but also provides examples of how physicians apply concepts of behavioral economics in practice.

Blumenthal-Barby analyzes ethical issues raised by “nudging” patient decision making and argues that the practice can improve patient decisions, prevent harm, and perhaps enhance autonomy. She then offers a more detailed ethical analysis of further questions that arise, including whether nudging amounts to manipulation, to what extent and at what point these techniques should be used, when and how their use would be wrong, and whether transparency about their use is required. She provides a snapshot of nudging “in the weeds,” reporting on practices she observed in clinical settings including psychiatry, pediatric critical care, and oncology. Warning that there is no “single, simple account of the ethics of nudging,” Blumenthal-Barby offers a qualified defense, arguing that a nudge can be justified in part by the extent to which it makes patients better off.

Jennifer S. Blumenthal-Barby is Cullen Professor of Medical Ethics and Associate Director of the Center for Medical Ethics and Health Policy at Baylor College of Medicine.

August | 6 x 9, 264 pp.

US \$45.00X/\$60.00 CAN paper
978-0-262-54248-7

Basic Bioethics series

Levels of Organization in the Biological Sciences

edited by Daniel S. Brooks, James DiFrisco, and William C. Wimsatt

Scientific philosophers examine the nature and significance of levels of organization, a core structural principle in the biological sciences.

This volume examines the idea of levels of organization as a distinct object of investigation, considering its merits as a core organizational principle for the scientific image of the natural world. It approaches levels of organization—roughly, the idea that the natural world is segregated into part-whole relationships of increasing spatiotemporal scale and complexity—in terms of its roles in scientific reasoning as a dynamic, open-ended idea capable of performing multiple overlapping functions in distinct empirical settings.

The contributors—scientific philosophers with longstanding ties to the biological sciences—discuss topics including the philosophical and scientific contexts for an inquiry into levels; whether the concept can actually deliver on its organizational promises; the role of levels in the development and evolution of complex systems; conditional independence and downward causation; and the extension of the concept into the sociocultural realm. Taken together, the contributions embrace the diverse usages of the term as aspects of the big picture of levels of organization.

Daniel S. Brooks is Visiting Scholar at the University of Cincinnati. **James DiFrisco** is Postdoctoral Fellow at KU Leuven. **William C. Wimsatt** is Peter B. Ritzma Professor of Philosophy, Emeritus, at the University of Chicago.

Contributors

Jan Baedke, Robert W. Batterman, Daniel S. Brooks, James DiFrisco, Markus I. Eronen, Carl Gillett, Sara Green, James Griesemer, Alan C. Love, Angela Potochnik, Thomas Reydon, Ilya Temkin, Jon Umerez, William C. Wimsatt, James Woodward

August | 7 x 10, 336 pp. | 30 illus.

US \$60.00X/\$79.00 CAN paper

978-0-262-04533-9

Vienna Series in Theoretical Biology

Entrepreneurship in the Wild

A Startup Field Guide

Felipe G. Massa

A learn-by-doing guide to developing, testing, and pitching a startup idea, balancing a pragmatic approach and rigorous academic content.

This innovative book offers a learn-by-doing guide to entrepreneurship that balances practical advice with rigorous academic content. It introduces important concepts, provides highly engaging examples, and supplies the tools needed to put lessons into practice, creating a research-supported, step-by-step reference for developing, testing, and pitching any startup idea. By integrating lean startup principles, design thinking, and elements of the jobs-to-be-done framework, this combination textbook-workbook allows readers to choose for themselves whether, or to what extent, to engage with theory.

All of the book's ten chapters encourage hands-on effort, providing readers with easy-to-follow steps, calls to action, and attainable milestones. Aspiring entrepreneurs will find this systematic approach to be more efficient than haphazard trial and error, and much more likely to yield concrete results. Chapters begin with a "mini case," offering real-world examples of each step in the process. These cases—all featuring entrepreneurs working outside the Silicon Valley bubble—include a meadery operator that turned customers into advocates by designing compelling experiences and the development of a dating app for dog lovers that found a unique niche in a crowded market.

Throughout, readers are immersed in the activity of starting a business, guided not only through the successful development of a startup but also to an understanding of the principles underlying entrepreneurship. The book can be used as a text in undergraduate and graduate classes and as a reference by entrepreneurs and innovators.

Felipe G. Massa is Associate Professor of Management and Entrepreneurship as well as the Founder and Faculty Director of the Center for Entrepreneurship and Innovation at Loyola University New Orleans.

August | 8 x 10, 168 pp. | 30 illus.

US \$35.00X/\$47.00 CAN paper

978-0-262-54257-9

Hub-and-Spoke Cartels

Why They Form, How They Operate, and How to Prosecute Them

Luke Garrod, Joseph E. Harrington, Jr., and Matthew Olczak

The first comprehensive economic and legal analysis of hub-and-spoke cartels, with detailed case studies.

A cartel forms when competitors conspire to limit competition through coordinated actions. Most cartels are composed exclusively of firms that would otherwise be in competition, but in a hub-and-spoke cartel, those competitors (“spokes”) conspire with the assistance of an upstream supplier or a downstream buyer (“hub”). This book provides the first comprehensive economic and legal analysis of hub-and-spoke cartels, explaining their formation and how they operate to create and sustain a collusive environment. Sixteen detailed case studies, including cases brought against toy manufacturer Hasbro and the Apple ebook case, illustrate the economic framework and legal strategies discussed.

The authors identify three types of hub-and-spoke cartels: when an upstream firm facilitates downstream firms to coordinate on higher prices; when a downstream intermediary facilitates upstream suppliers to coordinate on higher prices; and when a downstream firm facilitates upstream suppliers to exclude a downstream rival. They devote a chapter to each type, discussing the formation, coordination, enforcement, efficacy, and prosecution of these cartels, and consider general lessons that can be drawn from the case studies. Finally, they present strategies for prosecuting hub-and-spoke collusion. The book is written to be accessible to both economists and lawyers, and is intended for both scholars and practitioners.

Luke Garrod is Senior Lecturer in Economics at the School of Business and Economics at Loughborough University in the UK. **Joseph Harrington** is Patrick T. Harker Professor at the Wharton School of the University of Pennsylvania and author of *The Theory of Collusion and Competition Policy* (MIT Press) and other books. **Matthew Olczak** is a Senior Lecturer in Economics at Aston University in the UK.

November | 6 x 9, 264 pp. | 6 illus.

US \$55.00X/\$73.00 CAN paper
978-0-262-04620-6

Bond Markets, Analysis, and Strategies

Frank J. Fabozzi and Francesco A. Fabozzi

tenth edition

The updated edition of a widely used textbook that covers fundamental features of bonds, analytical techniques, and portfolio strategies.

This new edition of a widely used textbook covers types of bonds and their key features, analytical techniques for valuing bonds and quantifying their exposure to changes in interest rates, and portfolio strategies for achieving a client’s objectives. It includes real-world examples and practical applications of principles as provided by third-party commercial vendors. This tenth edition has been substantially updated, with two new chapters covering the theory and history of interest rates and the issues associated with bond trading. Although all chapters have been updated, particularly those covering structured products, the chapters on international bonds and managing a corporate bond portfolio have been completely revised.

The book covers the basic analytical framework necessary to understand the pricing of bonds and their investment characteristics; sectors of the debt market, including Treasury securities, corporate bonds, municipal bonds, and structured products (residential and commercial mortgage-backed securities and asset-backed securities); collective investment vehicles; methodologies for valuing bonds and derivatives; corporate bond credit risk; portfolio management, including the fundamental and quantitative approaches; and instruments that can be used to control portfolio risk.

Frank J. Fabozzi is Professor of Finance at EDHEC Business School, France. He has held positions at Princeton, MIT, NYU, and Carnegie Mellon. He is the author of *Capital Markets, Entrepreneurial Finance and Accounting for High-Tech Companies*, and coauthor of *Foundations of Global Financial Markets and Institutions*, all published by MIT Press. **Francesco A. Fabozzi** is Managing Editor of the *Journal of Financial Data Science*, coauthor of two books on asset management, and a doctoral student in data science at Stevens Institute of Technology.

December | 8 x 10, 880 pp. | 52 illus.

US \$150.00X/\$195.00 CAN cloth
978-0-262-04627-5

The Handbook of Rationality

edited by Markus Knauff and Wolfgang Spohn

The first reference on rationality that integrates accounts from psychology and philosophy, covering descriptive and normative theories from both disciplines.

Both analytic philosophy and cognitive psychology have made dramatic advances in understanding rationality, but there has been little interaction between the disciplines. This volume offers the first integrated overview of the state of the art in the psychology and philosophy of rationality. Written by leading experts from both disciplines, *The Handbook of Rationality* covers the main normative and descriptive theories of rationality—how people ought to think, how they actually think, and why we often deviate from what we can call rational. It also offers insights from other fields such as artificial intelligence, economics, the social sciences, and cognitive neuroscience.

The *Handbook* proposes a novel classification system for researchers in human rationality, and it creates new connections between rationality research in philosophy, psychology, and other disciplines. Following the basic distinction between theoretical and practical rationality, the book first considers the theoretical side, including normative and descriptive theories of logical, probabilistic, causal, and defeasible reasoning. It then turns to the practical side, discussing topics such as decision making, bounded rationality, game theory, deontic and legal reasoning, and the relation between rationality and morality. Finally, it covers topics that arise in both theoretical and practical rationality, including visual and spatial thinking, scientific rationality, how children learn to reason rationally, and the connection between intelligence and rationality.

Markus Knauff is Professor of Experimental Psychology and Cognitive Science at the University of Giessen. **Wolfgang Spohn** is Professor Emeritus at the Philosophy Department of the University of Konstanz and Senior Professor at the University of Tübingen.

December | 8 1/2 x 11, 928 pp. | 87 illus.

US \$195.00X/\$253.00 CAN cloth
978-0-262-04507-0

From Signal to Symbol

The Evolution of Language

Ronald Planer and Kim Sterelny

A novel account of the evolution of language and the cognitive capacities on which language depends.

In *From Signal to Symbol*, Ronald Planer and Kim Sterelny propose a novel theory of language, proposing that modern language is the product of a long series of increasingly rich protolanguages evolving over the last two million years. Arguing that language and cognition coevolved, they give a central role to archaeological evidence and they attempt to infer cognitive capacities on the basis of that evidence, which they link in turn to communicative capacities.

Countering other accounts, which move directly from archaeological traces to language, Planer and Sterelny show that rudimentary forms of many of the elements on which language depends can be found in the great apes and were part of the equipment of the earliest species in our lineage. After outlining the constraints a theory of the evolution of language should satisfy and filling in the details of their model, they take up the evolution of words, composite utterances, and hierarchical structure. They consider the transition from a predominantly gestural to a predominantly vocal form of language and discuss the economic and social factors that led to language. Finally, they evaluate their theory in terms of the constraints previously laid out.

Ronald Planer is a Research Affiliate of the Australian Research Council's Centre of Excellence for the Dynamics of Language and Postdoctoral Fellow in the Evolution of Language in the School of Languages and Linguistics at Melbourne University. **Kim Sterelny** is Professor of Philosophy at the Australian National University and the author of *The Evolved Apprentice: How Evolution Made Humans Unique* (MIT Press) and other books.

October | 6 x 9, 296 pp.

US \$35.00X/\$47.00 CAN cloth
978-0-262-04597-1

Life and Mind series

Principles of Abstract Interpretation

Patrick Cousot

Introduction to abstract interpretation, with examples of applications to the semantics, specification, verification, and static analysis of computer programs.

Formal methods are mathematically rigorous techniques for the specification, development, manipulation, and verification of safe, robust, and secure software and hardware systems. Abstract interpretation is a unifying theory of formal methods that proposes a general methodology for proving the correctness of computing systems, based on their semantics. The concepts of abstract interpretation underlie such software tools as compilers, type systems, and security protocol analyzers. This book provides an introduction to the theory and practice of abstract interpretation, offering examples of applications to semantics, specification, verification, and static analysis of programming languages with emphasis on calculational design.

The book covers all necessary computer science and mathematical concepts—including most of the logic, order, linear, fixpoint, and discrete mathematics frequently used in computer science—in separate chapters before they are used in the text. Each chapter offers exercises and selected solutions. Chapter topics include syntax, parsing, trace semantics, properties and their abstraction, fixpoints and their abstractions, reachability semantics, abstract domain and abstract interpreter, specification and verification, effective fixpoint approximation, relational static analysis, and symbolic static analysis. The main applications covered include program semantics, program specification and verification, program dynamic and static analysis of numerical properties and of such symbolic properties as dataflow analysis, software model checking, pointer analysis, dependency, and typing (both for forward and backward analysis), and their combinations. *Principles of Abstract Interpretation* is suitable for classroom use at the graduate level and as a reference for researchers and practitioners.

Patrick Cousot is Julius Silver, Roslyn S. Silver, and Enid Silver Winslow Professor in the Computer Science Department at New York University.

September | 7 x 10, 832 pp. | 53 illus.

US \$85.00X/\$112.00 CAN cloth
978-0-262-04490-5

An Introduction to Lifted Probabilistic Inference

edited by Guy Van den Broeck, Kristian Kersting, Sriraam Natarajan, and David Poole

Recent advances in the area of lifted inference, which exploits the structure inherent in relational probabilistic models.

Statistical relational AI (StaRAI) studies the integration of reasoning under uncertainty with reasoning about individuals and relations. The representations used are often called relational probabilistic models. Lifted inference is about how to exploit the structure inherent in relational probabilistic models, either in the way they are expressed or by extracting structure from observations. This book covers recent significant advances in the area of lifted inference, providing a unifying introduction to this very active field.

After providing necessary background on probabilistic graphical models, relational probabilistic models, and learning inside these models, the book turns to lifted inference, first covering exact inference and then approximate inference. In addition, the book considers the theory of liftability and acting in relational domains, which allows the connection of learning and reasoning in relational domains.

Guy Van den Broeck is Associate Professor of Computer Science at the University of California, Los Angeles. **Kristian Kersting** is Professor in the Computer Science Department and the Centre for Cognitive Science at Technische Universität Darmstadt. **Sriraam Natarajan** is Professor and the Director of the Center for Machine Learning in the Department of Computer Science at the University of Texas at Dallas. **David Poole** is Professor in the Department of Computer Science at the University of British Columbia.

August | 7 x 9, 454 pp.

US \$70.00X/\$92.00 CAN paper
978-0-262-54259-3

Neural Information Processing series

A New History of Modern Computing

Thomas Haigh and Paul E. Ceruzzi

How the computer became universal.

Over the past fifty years, the computer has been transformed from a hulking scientific supertool and data processing workhorse, remote from the experiences of ordinary people, to a diverse family of devices that billions rely on to play games, shop, stream music and movies, communicate, and count their steps. In *A New History of Modern Computing*, Thomas Haigh and Paul Ceruzzi trace these changes. A comprehensive reimagining of Ceruzzi's *A History of Modern Computing*, this new volume uses each chapter to recount one such transformation, describing how a particular community of users and producers remade the computer into something new.

Haigh and Ceruzzi ground their accounts of these computing revolutions in the longer and deeper history of computing technology. They begin with the story of the 1945 ENIAC computer, which introduced the vocabulary of “programs” and “programming,” and proceed through email, pocket calculators, personal computers, the World Wide Web, videogames, smart phones, and our current world of computers everywhere—in phones, cars, appliances, watches, and more. Finally, they consider the Tesla Model S as an object that simultaneously embodies many strands of computing.

Thomas Haigh is Professor of History at the University of Wisconsin–Milwaukee, Comenius Visiting Professor at Siegen University, and the coauthor of *ENIAC in Action: Making and Remaking the Modern Computer* (MIT Press).

Paul E. Ceruzzi is Curator Emeritus at the Smithsonian Institution's National Air and Space Museum and the author of *Internet Alley: High Technology in Tysons Corner 1945–2005*, *Computing: A Concise History* (both published by the MIT Press), and other books.

September | 7 x 10, 528 pp. | 88 illus.

US \$40.00X/\$54.00 CAN paper

978-0-262-54290-6

History of Computing series

Machines We Trust

Perspectives on Dependable AI

edited by **Marcello Pelillo** and **Teresa Scantamburlo**

Experts from disciplines that range from computer science to philosophy consider the challenges of building AI systems that humans can trust.

Artificial intelligence–based algorithms now marshal an astonishing range of our daily activities, from driving a car (“turn left in 400 yards”) to making a purchase (“products recommended for you”). How can we design AI technologies that humans can trust, especially in such areas of application as law enforcement and the recruitment and hiring process? In this volume, experts from a range of disciplines discuss the ethical and social implications of the proliferation of AI systems, considering bias, transparency, and other issues.

The contributors, offering perspectives from computer science, engineering, law, and philosophy, first lay out the terms of the discussion, considering the “ethical debts” of AI systems, the evolution of the AI field, and the problems of trust and trustworthiness in the context of AI. They go on to discuss specific ethical issues and present case studies of such applications as medicine and robotics, inviting us to shift the focus from the perspective of a “human-centered AI” to that of an “AI-decentered humanity.” Finally, they consider the future of AI, arguing that, as we move toward a hybrid society of cohabiting humans and machines, AI technologies can become humanity’s allies.

Marcello Pelillo is Professor of Computer Science at Ca’ Foscari University of Venice. **Teresa Scantamburlo** is a postdoctoral researcher at the European Centre for Living Technology (ECLT), Ca’ Foscari University of Venice.

Contributors

Francesco Amigoni, Federico Cabitza, Nello Cristianini, Mireille Hildebrandt, Marcello Pelillo, Gernot Rieder, Teresa Scantamburlo, Viola Schiaffonati, Judith Simon, Katherine Strandburg, Jennifer Wortman Vaughan, Hanna Wallach, Robert Williamson, Pak-Hang Wong

August | 7 x 10, 224 pp. | 7 illus.

US \$30.00X/\$40.00 CAN paper

978-0-262-54209-8

A Logical Theory of Causality

Alexander Bochman

A general formal theory of causal reasoning as a logical study of causal models, reasoning, and inference.

In this book, Alexander Bochman presents a general formal theory of causal reasoning as a logical study of causal models, reasoning, and inference, basing it on a supposition that causal reasoning is not a competitor of logical reasoning but its complement for situations lacking logically sufficient data or knowledge. Bochman also explores the relationship of this theory with the popular structural equation approach to causality proposed by Judea Pearl and explores several applications ranging from artificial intelligence to legal theory, including abduction, counterfactuals, actual and proximate causality, dynamic causal models, and reasoning about action and change in artificial intelligence.

As logical preparation, before introducing causal concepts, Bochman describes an alternative, situation-based semantics for classical logic that provides a better understanding of what can be captured by purely logical means. He then presents another prerequisite, outlining those parts of a general theory of nonmonotonic reasoning that are relevant to his own theory. These two components provide a logical background for the main, two-tier formalism of the causal calculus that serves as the formal basis of his theory. He presents the main causal formalism of the book as a natural generalization of classical logic that allows for causal reasoning. This provides a formal background for subsequent chapters. Finally, Bochman presents a generalization of causal reasoning to dynamic domains.

Alexander Bochman is Associate Professor in the Computer Science Department at Holon Institute of Technology in Holon, Israel.

August | 7 x 9, 366 pp.

US \$55.00X/\$73.00 CAN paper
978-0-262-04532-2

Technical Debt in Practice

How to Find It and Fix It

Neil Ernst, Rick Kazman, and Julien Delange

The practical implications of technical debt for the entire software life cycle; with examples and case studies.

Technical debt in software is incurred when developers take shortcuts and make ill-advised technical decisions in the initial phases of a project, only to be confronted with the need for costly and labor-intensive workarounds later. This book offers advice on how to avoid technical debt, how to locate its sources, and how to remove it. It focuses on the practical implications of technical debt for the entire software life cycle, with examples and case studies from companies that range from Boeing to Twitter.

Technical debt is normal; it is part of most iterative development processes. But if debt is ignored, over time it may become unmanageably complex, requiring developers to spend all of their effort fixing bugs, with no time to add new features—and after all, new features are what customers really value. The authors explain how to monitor technical debt, how to measure it, and how and when to pay it down. Broadening the conventional definition of technical debt, they cover requirements debt, implementation debt, testing debt, architecture debt, documentation debt, deployment debt, and social debt. They intersperse technical discussions with “Voice of the Practitioner” sidebars that detail real-world experiences with a variety of technical debt issues.

Neil Ernst is Assistant Professor of Computer Science at the University of Victoria, British Columbia. **Rick Kazman** is Professor in the Department of Information Technology Management at the University of Hawaii and Visiting Researcher at the Software Engineering Institute at Carnegie Mellon University. **Julien Delange** is Staff Software Engineer at Twitter and Founder of Code Inspector, a technical debt platform analysis.

August | 6 x 9, 288 pp. | 23 illus.

US \$35.00X/\$47.00 CAN paper
978-0-262-54211-1

Learning for Adaptive and Reactive Robot Control

A Dynamical Systems Approach

Aude Billard, Sina Mirrazavi, and Nadia Figueroa

Methods by which robots can learn control laws that enable real-time reactivity using dynamical systems; with applications and exercises.

This book presents a wealth of machine learning techniques to make the control of robots more flexible and safe when interacting with humans. It introduces a set of control laws that enable reactivity using dynamical systems, a widely used method for solving motion-planning problems in robotics. These control approaches can replan in milliseconds to adapt to new environmental constraints and offer safe and compliant control of forces in contact. The techniques offer theoretical advantages, including convergence to a goal, non-penetration of obstacles, and passivity. The coverage of learning begins with low-level control parameters and progresses to higher-level competencies composed of combinations of skills.

Learning for Adaptive and Reactive Robot Control can be used in graduate-level courses in robotics, and, the chapters proceed from fundamentals to more advanced content. The first section presents an overview of the techniques introduced, including learning from demonstration, optimization, and reinforcement learning. Subsequent sections present the core techniques for learning control laws with dynamical systems, trajectory planning with dynamical systems, and methods for compliant and force control using dynamical systems. Each chapter describes applications, which range from arm manipulators to whole-body control of humanoid robots, and offers both pencil-and-paper and programming exercises. Lecture videos, slides, and MATLAB code examples are available on the author's website. An instructors-only website offers additional material.

Aude Billard is Professor, School of Engineering, Ecole Polytechnique Federale de Lausanne (EPFL) and Director of the Learning Algorithms and Systems Laboratory (LASA). **Sina Mirrazavi** is a Senior Researcher at Sony. **Nadia Figueroa** is a Postdoctoral Fellow at MIT.

December | 7 x 10, 456 pp. | 165 illus.

US \$85.00X/\$112.00 CAN cloth
978-0-262-04616-9

Intelligent Robotics and Autonomous Agents series

Image Objects

An Archaeology of Computer Graphics

Jacob Gaboury

How computer graphics transformed the computer from a calculating machine into an interactive medium, as seen through the histories of five technical objects.

Most of us think of computer graphics as a relatively recent invention, enabling the spectacular visual effects and lifelike simulations we see in current films, television shows, and digital games. In fact, computer graphics have been around as long as the modern computer itself, and played a fundamental role in the development of our contemporary culture of computing. In *Image Objects*, Jacob Gaboury offers a prehistory of computer graphics through an examination of five technical objects—an algorithm, an interface, an object standard, a programming paradigm, and a hardware platform—arguing that computer graphics transformed the computer from a calculating machine into an interactive medium.

Gaboury explores early efforts to produce an algorithmic solution for the calculation of object visibility; considers the history of the computer screen and the random-access memory that first made interactive images possible; examines the standardization of graphical objects through the Utah teapot, the most famous graphical model in the history of the field; reviews the graphical origins of the object-oriented programming paradigm; and, finally, considers the development of the graphics processing unit as the catalyst that enabled an explosion in graphical computing at the end of the twentieth century.

The development of computer graphics, Gaboury argues, signals a change not only in the way we make images but also in the way we mediate our world through the computer—and how we have come to reimagine that world as computational.

Jacob Gaboury is Assistant Professor of Film and Media at the University of California, Berkeley.

August | 6 x 9, 312 pp. | 20 color plates, 133 b&w illus.

US \$35.00X/\$47.00 CAN cloth
978-0-262-04503-2

Things We Could Design

For More Than Human-Centered Worlds

Ron Wakkary

How posthumanist design enables a world in which humans share center stage with nonhumans, with whom we are entangled.

Over the past forty years, designers have privileged human values such that human-centered design is seen as progressive. Yet because all that is not human has been depleted, made extinct, or put to human use, today's design contributes to the existential threat of climate change and the ongoing extinctions of other species. In *Things We Could Design*, Ron Wakkary argues that human-centered design is not the answer to our problems but is itself part of the problem. Drawing on philosophy, design theory, and numerous design works, he shows the way to a relational and expansive design based on humility and cohabitation.

Wakkary says that design can no longer ignore its exploitation of nonhuman species and the materials we mine for and reduce to human use. Posthumanism, he argues, enables a rethinking of design that displaces the human at the center of thought and action. Weaving together posthumanist philosophies with design, he describes what he calls *things*—nonhumans made by designers—and calls for a commitment to design with more than human participation. Wakkary also focuses on design as “nomadic practices”—a multiplicity of intentionalities and situated knowledges that shows design to be expansive and pluralistic. He calls his overall approach “designing-with”: the practice of design in a world in which humans share center stage with nonhumans, and in which we are bound together materially, ethically, and existentially.

Ron Wakkary is Professor in the School of Interactive Arts and Technology and founder of the Everyday Design Studio at Simon Fraser University.

August | 6 x 9, 304 pp. | 51 illus.

US \$35.00X/\$47.00 CAN paper

978-0-262-54299-9

Design Thinking, Design Theory series

Urban Play

Make-Believe, Technology, and Space

Fábio Duarte and Ricardo Álvarez

Why technology is most transformative when it is playful, and innovative spatial design happens only when designers are both tinkers and dreamers.

In *Urban Play*, Fábio Duarte and Ricardo Álvarez argue that the merely functional aspects of technology may undermine its transformative power. Technology is powerful not when it becomes optimally functional, but while it is still playful and open to experimentation. It is through play—in the sense of acting for one's own enjoyment rather than to achieve a goal—that we explore new territories, create new devices and languages, and transform ourselves. Only then can innovative spatial design create resonant spaces that go beyond functionalism to evoke an emotional response in those who use them.

The authors show how creativity emerges in moments of instability, when a new technology overthrows an established one, or when internal factors change a technology until it becomes a different technology. Exploring the role of fantasy in design, they examine Disney World and its outsize influence on design and on forms of social interaction beyond the entertainment world. They also consider Las Vegas and Dubai, desert cities that combine technology with fantasies of pleasure and wealth. Video games and interactive media, they show, infuse the design process with interactivity and participatory dynamics, leaving spaces open to variations depending on the users' behavior. Throughout, they pinpoint the critical moments when technology plays a key role in reshaping how we design and experience spaces.

Fábio Duarte is Principal Research Scientist at the MIT Senseable City Lab, Lecturer in MIT's Department of Urban Studies and Planning, and Professor at PUCPR, Brazil. **Ricardo Álvarez** is a Postdoctoral Fellow at the MIT Senseable City Lab.

August | 6 x 9, 224 pp. | 39 illus.

US \$30.00X/\$40.00 CAN paper

978-0-262-04534-6

Teaching Computational Thinking

An Integrative Approach for Middle and High School Learning

Maureen D. Neumann and Lisa Dion

with Robert Snapp

A guide for educators to incorporate computational thinking—a set of cognitive skills applied to problem solving—into a broad range of subjects.

Computational thinking—a set of mental and cognitive tools applied to problem solving—is a fundamental skill that all of us (and not just computer scientists) draw on. Educators have found that computational thinking enhances learning across a range of subjects and reinforces students' abilities in reading, writing, and arithmetic. This book offers a guide for incorporating computational thinking into middle school and high school classrooms, presenting a series of activities, projects, and tasks that employ a range of pedagogical practices and cross a variety of content areas.

As students problem solve, communicate, persevere, work as a team, and learn from mistakes, they develop a concrete understanding of the abstract principles used in computer science to create code and other digital artifacts. The book guides students and teachers to integrate computer programming with visual art and geometry, generating abstract expressionist-style images; construct topological graphs that represent the relationships between characters in such literary works as *Harry Potter and the Sorcerer's Stone* and *Romeo and Juliet*; apply Newtonian physics to the creation of computer games; and locate, analyze, and present empirical data relevant to social and political issues. Finally, the book lists a variety of classroom resources, including the programming languages Scratch (free to all) and CodeSters (free to teachers). An accompanying website contains the executable programs used in the book's activities.

Maureen Neumann is Professor in the College of Education and Social Services at the University of Vermont. **Lisa Dion** is Lecturer in the Department of Computer Science at the University of Vermont. **Robert Snapp** is Senior Software Engineer at Google.

December | 7 x 10, 160 pp. | 111 color illus.

US \$45.00X/\$60.00 CAN paper
978-0-262-04505-6

Techno-Vernacular Creativity and Innovation

Culturally Relevant Making Inside and Outside of the Classroom

Nettrice R. Gaskins

foreword by Leah Buechley

afterword by Ruha Benjamin

A novel approach to STEAM learning that engages students from historically marginalized communities in culturally relevant and inclusive maker education.

The growing maker movement in education has become an integral part of both STEM and STEAM learning, tapping into the natural DIY inclinations of creative people as well as the educational power of inventing or making things. And yet African American, Latino/a American, and Indigenous people are underrepresented in maker culture and education. In this book, Nettrice Gaskins proposes a novel approach to STEAM learning that engages students from historically marginalized communities in culturally relevant and inclusive maker education. *Techno-vernacular creativity* (TVC) connects technical literacy, equity, and culture, encompassing creative innovations produced by ethnic groups that are often overlooked.

TVC uses three main modes of activity: reappropriation, remixing, and improvisation. Gaskins looks at each of the three modes in turn, guiding readers from research into practice. Drawing on real-world examples, she shows how TVC creates dynamic learning environments where underrepresented ethnic students feel that they belong. Students who remix computationally, for instance, have larger toolkits of computational skills with which to connect cultural practices to STEAM subjects; reappropriation offers a way to navigate cultural repertoires; improvisation is firmly rooted in cultural and creative practices. Finally, Gaskins explores an equity-oriented approach that makes a distinction between conventional or dominant pedagogical approaches and culturally relevant or responsive making methods and practices. She describes TVC habits of mind and suggests methods of instructions and projects.

Nettrice R. Gaskins is a digital artist, youth educator, independent academic, and cultural critic. Previously Director of the STEAM Lab at Boston Arts Academy, she is currently Assistant Director of the STEAM Learning Lab at Lesley University.

August | 6 x 9, 206 pp. | 50 illus.

US \$35.00X/\$47.00 CAN paper
978-0-262-54266-1

Open Knowledge Institutions

Reinventing Universities

Lucy Montgomery, John Hartley, Cameron Neylon, Malcolm Gillies, Eve Gray, Carsten Herrmann-Pillath, Chun-Kai (Karl) Huang, Joan Leach, Jason Potts, Xiang Ren, Katherine Skinner, Cassidy R. Sugimoto, and Katie Wilson

The future of the university as an open knowledge institution that institutionalizes diversity and contributes to a common resource of knowledge: a manifesto.

In this book, a diverse group of authors—including open access pioneers, science communicators, scholars, researchers, and university administrators—offer a bold proposition: universities should become open knowledge institutions, acting with principles of openness at their center and working across boundaries and with broad communities to generate shared knowledge resources for the benefit of humanity. Calling on universities to adopt transparent protocols for the creation, use, and governance of these resources, the authors draw on cutting-edge theoretical work, offer real-world case studies, and outline ways to assess universities' attempts to achieve openness.

Digital technologies have already brought about dramatic changes in knowledge format and accessibility. The book describes further shifts that open knowledge institutions must make as they move away from closed processes for verifying expert knowledge and toward careful, mediated approaches to sharing it with wider publics. It examines these changes in terms of diversity, coordination, and communication; discusses policy principles that lay out paths for universities to become fully fledged open knowledge institutions; and suggests ways that openness can be introduced into existing rankings and metrics. Case studies—including Wikipedia, the Library Publishing Coalition, Creative Commons, and Open and Library Access—illustrate key processes.

Lucy Montgomery, John Hartley, Cameron Neylon, Malcolm Gillies, Eve Gray, Carsten Herrmann-Pillath, Chun-Kai (Karl) Huang, Joan Leach, Jason Potts, Xiang Ren, Katherine Skinner, Cassidy R. Sugimoto, and Katie Wilson are scholars and researchers who participated in the conference in the Moondyne Valley, Australia, that produced this book.

August | 6 x 9, 176 pp. | 14 illus.

US \$25.00X/\$34.00 CAN paper
978-0-262-54243-2

Learning in Governance

Climate Policy Integration in the European Union

Katharina Rietig

An investigation of the role of learning and its impact on policy change, as exemplified in European Union climate policy integration.

Although learning is often considered an important factor in effective environmental governance, it is not clear to what extent learning affects decision making and policy outcomes. In this book, Katharina Rietig examines the role of learning—understood as additional knowledge or experience that is taken into account by policymakers—in earth system governance and policy change. She does this by examining learning in European Union climate policy integration, looking in detail at the examples of the Renewable Energy Directive, its controversial biofuels component, and the greening measures in the Common Agricultural Policy.

To examine how learning occurs in the policy process, how to differentiate aspects of learning, and under what conditions learning matters for policy outcomes, Rietig introduces the Learning in Governance Framework, applying it to analyze the EU examples. She finds that policy outcomes are affected through leadership of policy entrepreneurs, who use previously acquired knowledge and past experience to achieve outcomes aligned with their deeper beliefs and policy objectives. She concludes that learning does matter in governance as an intervening variable and can affect policy outcomes in combination with dedicated leadership by policy entrepreneurs who act as learning brokers. Bargaining dominates the policymaking process among actors who represent the interests of different organizations. Rietig's theoretical framework, empirical studies, and nuanced analysis offer a new perspective on the relevance of learning in earth system governance.

Katharina Rietig is Senior Lecturer in International Politics at Newcastle University.

August | 6 x 9, 232 pp. | 4 illus.

US \$45.00X/\$60.00 CAN paper
978-0-262-54297-5

Earth System Governance series

The Politics of Rights of Nature

Strategies for Building a More Sustainable Future

Craig M. Kauffman and Pamela L. Martin

How Rights of Nature laws are transforming governance to address environmental crises through more ecologically sustainable approaches to development.

With the window of opportunity to take meaningful action on climate change and mass extinction closing, a growing number of communities, organizations, and governments around the world are calling for Rights of Nature (RoN) to be legally recognized. RoN advocates are creating new laws that recognize natural ecosystems as subjects with inherent rights, and appealing to courts to protect those rights. Going beyond theory and philosophy, in this book Craig Kauffman and Pamela Martin analyze the politics behind the creation and implementation of these laws, as well as the effects of the laws on the politics of sustainable development.

Kauffman and Martin tell how community activists, lawyers, judges, scientists, government leaders, and ordinary citizens have formed a global movement to advance RoN as a solution to the environmental crises facing the planet. They compare successful and failed attempts to implement RoN at various levels of government in six countries—Bolivia, Colombia, Ecuador, India, New Zealand, and the United States—asking why these laws emerged and proliferated in the mid-2000s, why they construct RoN differently, and why some efforts at implementation are more successful than others. As they analyze efforts to use RoN as a tool for constructing more ecocentric sustainable development, capable of achieving the 2030 Agenda for Sustainable Development goal of living “in harmony with Nature,” Kauffman and Martin show how RoN jurisprudence evolves through experimentation and reshapes the debates surrounding sustainable development.

Craig M. Kauffman is Associate Professor of Political Science at the University of Oregon. **Pamela L. Martin** is a Professor of Politics at Coastal Carolina University.

August | 6 x 9, 280 pp. | 8 illus.

US \$35.00X/\$47.00 CAN paper
978-0-262-54292-0

Homebrew Gaming and the Beginnings of Vernacular Digitality

Melanie Swalwell

The overlooked history of an early appropriation of digital technology: the creation of games through coding and hardware hacking by microcomputer users.

From the late 1970s through the mid-1980s, low-end microcomputers offered many users their first taste of computing. A major use of these inexpensive 8-bit machines—including the TRS System 80s and the Sinclair, Atari, Microbee, and Commodore ranges—was the development of homebrew games. Users with often self-taught programming skills devised the graphics, sound, and coding for their self-created games. In this book, Melanie Swalwell offers a history of this era of homebrew game development, arguing that it constitutes a significant instance of the early appropriation of digital computing technology.

Drawing on interviews and extensive archival research on homebrew creators in 1980s Australia and New Zealand, Swalwell explores the creation of games on microcomputers as a particular mode of everyday engagement with new technology. She discusses the public discourses surrounding microcomputers and programming by home coders; user practices; the development of game creators' ideas, with the game *Donut Dilemma* as a case study; the widely practiced art of hardware hacking; and the influence of 8-bit aesthetics and gameplay on the contemporary game industry. With *Homebrew Gaming and the Beginnings of Vernacular Digitality*, Swalwell reclaims a lost chapter in video game history, connecting it to the rich cultural and media theory around everyday life and to critical perspectives on user-generated content.

Melanie Swalwell is Professor of Digital Media Heritage at Swinburne University of Technology in Melbourne, Australia. She coedited *Fans and Videogames: Histories, Fandom, Archives and The Pleasures of Computer Gaming: Essays on Cultural History, Theory and Aesthetics*.

August | 6 x 9, 256 pp. | 16 color plates, 35 b&w illus.

US \$35.00X/\$47.00 CAN cloth
978-0-262-04477-6

Game Histories

A Playful Production Process

For Game Designers (and Everyone)

Richard Lemarchand

How to achieve a happier and healthier game design process by connecting the creative aspects of game design with techniques for effective project management.

This book teaches game designers, aspiring game developers, and game design students how to take a digital game project from start to finish—from conceptualizing and designing to building, playtesting, and iterating—while avoiding the uncontrolled overwork known among developers as “crunch.” Written by a legendary game designer, *A Playful Production Process* outlines a process that connects the creative aspects of game design with proven techniques for effective project management. The book outlines four project phases—ideation, preproduction, full production, and post-production—that give designers and developers the milestones they need to advance from the first glimmerings of an idea to a finished game.

The book covers each of the project phases in turn, proceeding from ideation through post-production. Most chapters discuss a subject related to making a game in a structured way, describing the activities that take place in each phase, the milestones that mark the beginning and end of each phase, and the deliverables due at each milestone; others cover processes used to communicate, collaborate, and manage the project. This hands-on “playcentric” approach will help designers conceptualize and create future projects with greater efficiency, more creativity, and less pain.

Richard Lemarchand, a game designer who worked in the videogame industry for more than twenty years, is Associate Professor in the Interactive Media and Games Division of the School of Cinematic Art at the University of Southern California. Among many other projects, he led or co-led the design of all three games in the PlayStation 3 *Uncharted* series, including the award-winning *Uncharted 2: Among Thieves*.

September | 7 x 10, 400 pp. | 66 illus.

US \$45.00X/\$60.00 CAN cloth
978-0-262-04551-3

Making Games for Impact

Kurt Squire

Designing games for learning: case studies show how to incorporate impact goals, build a team, and work with experts to create an effective game.

Digital games for learning are now commonplace, used in settings that range from K–12 education to advanced medical training. In this book, Kurt Squire examines the ways that games make an impact on learning, investigating how designers and developers incorporate authentic social impact goals, build a team, and work with experts in order to make games that are effective and marketable. Because there is no one design process for making games for impact—specific processes arise in response to local needs and conditions—Squire presents a series of case studies that range from a small, playable game created by a few programmers and an artist to a multimillion-dollar project with funders, outside experts, and external constraints.

These cases, drawn from the Games + Learning + Society Center at the University of Wisconsin–Madison, show designers tackling such key issues as choosing platforms, using data analytics to guide development, and designing for new markets. Although not a how-to guide, the book offers developers, researchers, and students real-world lessons in greenlighting a project, scaling up design teams, game-based assessment, and more. The final chapter examines the commercial development of an impact game in detail, describing the creation of an astronomy game, *At Play in the Cosmos*, that ships with an introductory college textbook.

Kurt Squire is a Professor of Informatics at the University of California, Irvine, where he directs the Participatory Learning Group within the Connected Learning Lab. He previously Codirected the Games + Learning + Society Center at the University of Wisconsin–Madison.

October | 6 x 9, 240 pp. | 40 illus.

US \$30.00X/\$40.00 CAN paper
978-0-262-54217-3

Cannabis

Global Histories

edited by **Lucas Richert** and **James H. Mills**

Cannabis consumption, commerce, and control in global history, from the nineteenth century to the present day.

This book gathers together authors from the new wave of cannabis histories that has emerged in recent decades. It offers case studies from Africa, Asia, the Americas, Europe, and the Middle East. It does so to trace a global history of the plant and its preparations, arguing that Western colonialism shaped and disseminated ideas in the nineteenth century that came to drive the international control regimes of the twentieth.

More recently, the emergence of commercial interests in cannabis has been central to the challenges that have undermined that cannabis consensus. Throughout, the determination of people around the world to consume substances made from the plant has defied efforts to stamp them out and often transformed the politics and cultures of using them. These texts also suggest that globalization might have a cannabis history. The migration of consumers, the clandestine networks established to supply them, and international cooperation on control may have driven much of the interconnectedness that is a key feature of the contemporary world.

Lucas Richert is George Urdang Chair in the History of Pharmacy at the University of Wisconsin–Madison. His many publications include *Break on Through: Radical Psychiatry and the American Counterculture* (MIT Press). **James H. Mills** is Professor of Modern History at the Centre for the Social History of Health and Healthcare (CSHHH) Glasgow, University of Strathclyde. His publications include *Cannabis Nation: Control and Consumption in Britain, 1928–2008*.

Contributors

Jamie Banks, James Bradford, Isaac Campos, Neil Carrier, Emily Dufton, Maziyar Ghiabi, David A. Guba Jr., Peter Hynd, Gernot Klantschnig, Haggai Ram, Ned Richardson-Little, José Domingo Schievenini, Stephen Snelders, Suzanne Taylor, Thembisa Waejten

August | 6 x 9, 424 pp. | 20 illus.

US \$55.00X/\$73.00 CAN paper
978-0-262-04520-9

Building the New Economy

Data as Capital

Alex Pentland, Alexander Lipton, and Thomas Hardjono

How to empower people and communities with user-centric data ownership, transparent and accountable algorithms, and secure digital transaction systems.

Data is now central to the economy, government, and health systems—so why are data and the AI systems that interpret the data in the hands of so few people? *Building the New Economy* calls for us to reinvent the ways that data and artificial intelligence are used in civic and government systems. Arguing that we need to think about data as a new type of capital, the authors show use data trusts and distributed ledgers to empower people and communities with user-centric data ownership, transparent and accountable algorithms, machine learning fairness principles and methodologies, and secure digital transaction systems.

It's well-known that social media generate disinformation and that mobile phone tracking apps threaten privacy. But these same technologies may also enable the creation of more agile systems in which power and decision-making are distributed among stakeholders rather than concentrated in a few hands. Offering both big ideas and detailed blueprints, the authors describe such key building blocks as data cooperatives, tokenized funding mechanisms, and tradecoin architecture. They also discuss technical issues, including how to build an ecosystem of trusted data, the implementation of digital currencies, and interoperability, and consider the evolution of computational law systems.

Alex “Sandy” Pentland, called one of the “seven most powerful data scientists in the world” by *Forbes*, directs the MIT-wide initiative MITConnection Science. **Alexander Lipton** is Professor and Dean’s Fellow at the Jerusalem Business School at the Hebrew University of Jerusalem, and Connection Fellow at MIT. **Thomas Hardjono** is Technology Director of the MIT Connection Science and the MIT Trust::Data Consortium.

“With its perspicacious, timely and brilliant nature, *Building the New Economy* is a rare must read.”

—**Edward Price, *Interdisciplinary Journal of Economics and Business Law***

October | 5 1/4 x 8, 456 pp. | 66 illus.

US \$35.00X/\$47.00 CAN paper
978-0-262-54315-6

MIT Connection Science and Engineering

Language in Development

A Crosslinguistic Perspective

edited by Gita Martohardjono and Suzanne Flynn

Explorations of language development in different types of learner populations and across various languages.

This volume examines language development in different types of learner populations and across various languages. The contributors analyze experimental studies of child and adult language acquisition, heritage language development, bilingualism, and language disorders. They consider theoretical and methodological issues; language development in children, discussing topics that range from gestures to errors in person and number agreement; and development and attrition of (morpho)syntactic constructions in second language learners, bilinguals, and Alzheimer's patients.

The approach is “crosslinguistic” in three senses of the word: the contributors offer analyses of acquisition phenomena in different languages; they consider “crosslinguistic influence,” or the potential effects of multiple languages on one another in the mind of the same speaker; and (in a novel use of the term, proposed by the editors), the chapters bring together theoretical and methodological approaches pertinent to the linguistics of language development in children, adults, and heritage speakers.

Gita Martohardjono is Associate Professor of Linguistics at Queens College and the Graduate Center of the City University of New York. **Suzanne Flynn** is Professor of Linguistics in the Department of Linguistics and Philosophy at MIT.

Contributors

Jennifer Austin, María Blume, Kimberly Cassidy, Cristina Dye, Suzanne Flynn, Claire Foley, David Giancaspro, Lila R. Gleitman, Yarden Kedar, Elaine C. Klein, D. Terence Langendoen, Christen N. Madsen II, Gita Martohardjono, Reiko Mazuka, Rebecca Nappa, Jerome Packard, Anna Papafragou, Silvia Perez-Cortes, Ian Phillips, Liliana Sánchez, Lynn M. Santelmann, Richard G. Schwartz, Janet Cohen Sherman, John C. Trueswell, Virginia Valian, Yun Yao

August | 6 x 9, 360 pp.

US \$95.00X/\$125.00 CAN paper
978-0-262-54200-5

The Open Handbook of Linguistic Data Management

edited by Andrea L. Berez-Kroeker, Bradley McDonnell, Eve Koller, and Lauren B. Collister

A guide to principles and methods for the management, archiving, sharing, and citing of linguistic research data, especially digital data.

“Doing language science” depends on collecting, collecting, transcribing, annotating, analyzing, storing, and sharing linguistic research data. This volume offers a guide to linguistic data management, engaging with current trends toward the transformation of linguistics into a more data-driven and reproducible scientific endeavor. It offers both principles and methods, presenting the conceptual foundations of linguistic data management and a series of case studies, each of which demonstrates a concrete application of abstract principles in a current practice.

In part 1, contributors bring together knowledge from information science, archiving, and data stewardship relevant to linguistic data management. Topics covered include implementation principles, archiving data, finding and using datasets, and the valuation of time and effort involved in data management. Part 2 presents snapshots of practices across various subfields, with each chapter presenting a unique data management project with generalizable guidance for researchers. *The Open Handbook of Linguistic Data Management* is an essential addition to the toolkit of every linguist, guiding researchers toward making their data FAIR: Findable, Accessible, Interoperable, and Reusable.

Andrea Berez-Kroeker is Associate Professor in the Department of Linguistics at the University of Hawai'i at Mānoa. **Bradley McDonnell** is Assistant Professor in the Department of Linguistics at the University of Hawai'i at Mānoa.

Eve Koller is Assistant Professor at Brigham Young University Hawai'i.

Lauren B. Collister is the Director of the Office of Scholarly Communication and Publishing at the University Library System at the University of Pittsburgh.

September | 8.5 x 11, 752 pp. | 129 illus.

US \$250.00X/\$324.00 CAN cloth
978-0-262-04526-1

Open Handbooks in Linguistics

A Selectional Theory of Adjunct Control

Idan Landau

A novel, systematic theory of adjunct control, explaining how and why adjuncts shift between obligatory and nonobligatory control.

Control in adjuncts involves a complex interaction of syntax, semantics, and pragmatics, which so far has resisted systematic analysis. In this book, Idan Landau offers the first comprehensive account of adjunct control. Extending the framework developed in his earlier book, *A Two-Tiered Theory of Control*, Landau analyzes ten different types of adjuncts and shows that they fall into two categories: those displaying strict obligatory control (OC) and those alternating between OC and nonobligatory control (NOC). He explains how and why adjuncts shift between OC and NOC, unifying their syntactic, semantic, and pragmatic properties.

Landau shows that the split between the two types of adjuncts reflects a fundamental distinction in the semantic type of the adjunct: *property* (OC) or *proposition* (NOC), a distinction independently detectable by the adjunct's tolerance to a lexical subject. After presenting a fully compositional account of controlled adjuncts, Landau tests and confirms the specific configurational predictions for each type of adjunct. He describes the interplay between OC and NOC in terms of general principles of competition—both within the grammar and outside of it, in the pragmatics and in the processing module—shedding new light on classical puzzles in the acquisition of adjunct control by children. Along the way, he addresses a range of empirical phenomena, including implicit arguments, event control, logophoricity, and topicality.

Idan Landau is Professor of Linguistics at Ben Gurion University and the author of *A Two-Tiered Theory of Control* (MIT Press).

October | 6 x 9, 272 pp. | 12 illus.

US \$55.00X/\$73.00 CAN paper
978-0-262-54285-2

Linguistic Inquiry Monographs series

Living Books

Experiments in the Posthumanities

Janneke Adema

Reimagining the scholarly book as living and collaborative —not as commodified and essentialized, but in all its dynamic materiality.

In this book, Janneke Adema proposes that we reimagine the scholarly book as a living and collaborative project—not as linear, bound, and fixed, but fluid, remixed, and liquid, a space for experimentation. She presents a series of cutting-edge experiments in arts and humanities book publishing, showcasing the radical new forms that book-based scholarly work might take in the digital age. Adema's proposed alternative futures for the scholarly book go beyond such print-based assumptions as fixity, stability, the single author, originality, and copyright, reaching instead for a dynamic and emergent materiality.

Adema suggests ways to *unbind* the book, describing experiments in scholarly book publishing with new forms of anonymous collaborative authorship, radical open access publishing, and processual, living, and remixed publications, among other practices. She doesn't cast digital as the solution and print as the problem; the problem in scholarly publishing, she argues, is not print itself, but the way print has been commodified and essentialized. Adema explores alternative, more ethical models of authorship; constructs an alternative genealogy of openness; and examines opportunities for intervention in current cultures of knowledge production. Finally, asking why it is that we cut and bind our research together at all, she examines two book publishing projects that experiment with remix and reuse and try to rethink and reperform the book-apparatus by taking responsibility for the cuts they make.

Janneke Adema is Assistant Professor in Digital Media at the Centre for Postdigital Cultures at Coventry University. She coedited *Symbiosis*, and *Really, We're Helping To Build This... Business: The Academia.edu Files*, both experiments in scholarly publishing.

August | 6 x 9, 352 pp. | 5 illus.

US \$35.00X/\$47.00 CAN paper
978-0-262-04602-2

A Leonardo Book

Seeing Human Rights

Video Activism as a Proxy Profession

Sandra Ristovska

As video becomes an important tool to expose injustice, an examination of how human rights organizations are seeking to professionalize video activism.

Visual imagery is at the heart of humanitarian and human rights activism, and video has become a key tool in these efforts. The Saffron Revolution in Myanmar, the Green Movement in Iran, and Black Lives Matter in the United States have all used video to expose injustice. In *Seeing Human Rights*, Sandra Ristovska examines how human rights organizations are seeking to professionalize video activism through video production, verification standards, and training. The result, she argues, is a proxy profession that uses human rights videos to tap into journalism, the law, and political advocacy.

Ristovska explains that this proxy profession retains some tactical flexibility in its use of video while giving up on the more radical potential and imaginative scope of video activism as a cultural practice. Drawing on detailed analysis of legal cases and videos as well as extensive interviews with staff members of such organizations as Amnesty International, Human Rights Watch, WITNESS, the International Criminal Tribunal for the former Yugoslavia (ICTY), and the International Criminal Court (ICC), Ristovska considers the unique affordances of video and examines the unfolding relationships among journalists, human rights organizations, activists, and citizens in global crisis reporting. She offers a case study of the visual turn in the law; describes advocacy and marketing strategies; and argues that the transformation of video activism into a proxy profession privileges institutional and legal spaces over broader constituencies for public good.

Sandra Ristovska is Assistant Professor of Media Studies in the College of Media, Communication and Information at the University of Colorado Boulder and coeditor of *Visual Imagery and Human Rights Practice*.

August | 6 x 9, 288 pp. | 30 illus.

US \$35.00X/\$47.00 CAN paper
978-0-262-54253-1

Information Policy series

The Hidden Life of the Basal Ganglia

At the Base of Brain and Mind

Hagai Bergman

The anatomy and physiology of the basal ganglia and their relation to brain and behavior, disorders and therapies, and philosophy of mind and moral values.

The main task of the basal ganglia—a group of subcortical nuclei, located at the base of the brain—is to optimize and execute our automatic behavior. In this book, Hagai Bergman analyzes the anatomy and physiology of the basal ganglia, discussing their relation to brain and behavior, to disorders and therapies, and even to moral values. Drawing on his forty years of studying the basal ganglia, Bergman presents new information on physiology and computational models, Parkinson's disease and other ganglia-related disorders, and such therapies as deep brain stimulation.

Focusing on studies of nonhuman primates and human basal ganglia and relying on system physiology and in vivo extra-cellular recording techniques, Bergman first describes the major brain structures that constitute the basal ganglia, the morphology of their cellular elements, their synaptic connectivity and their physiological function in health and disease. He discusses the computational physiology of the healthy basal ganglia, describing four generations of computational models, and then traces the computational physiology of basal ganglia-related disorders and their treatments, including Parkinson's disease and its pharmacological and surgical therapies. Finally, Bergman considers the implications of these findings for such moral concerns as free will. Explaining this leap into domains rarely explored in neuroscientific accounts, Bergman writes that the longer he studies the basal ganglia, the more he is convinced that they are truly the base of both brain and mind.

Hagai Bergman is Simone and Bernard Guttman Chair in Brain Research and Professor of Physiology in the Edmond and Lily Safra Center (ELSC) for Brain Research and Faculty of Medicine at the Hebrew University of Jerusalem.

October | 7 x 10, 288 pp. | 100 color illus.

US \$50.00X/\$66.00 CAN paper
978-0-262-54311-8

Wittgenstein's Artillery

Philosophy as Poetry

James C. Klagge

How Wittgenstein sought a more effective way of reaching his audience by a poetic style of doing philosophy.

Ludwig Wittgenstein once said, “really one should write philosophy only as one writes poetry.” In *Wittgenstein's Artillery*, James Klagge shows how, in search of ways to reach his audience, Wittgenstein tried a more poetic style of doing philosophy. Klagge argues that, deploying this new philosophical “artillery”—Klagge’s terms for Wittgenstein’s methods of influencing his readers and students—Wittgenstein moved from an esoteric mode to an evangelical mode, aiming for an effect on his audience that was noncognitive, appealing to the temperament in addition to the intellect.

Wittgenstein was an artillery spotter—directing artillery fire to targets—in the Austrian army during World War I, and Klagge argues that, years later, he became a philosophical spotter, struggling to find the right artillery to accomplish his philosophical purpose. Klagge shows how Wittgenstein’s work with his students influenced his style of writing philosophy and motivated him to care about the effect of his ideas on his audience. To illustrate Wittgenstein’s evolving approach, Klagge draws on not only Wittgenstein’s best-known works but also such lesser-known material as notebooks, dictations, lectures, and recollections of students. Klagge then goes beyond Wittgenstein to present a range of literature—biblical parables and children’s stories, Dostoevsky and Tolstoy, Kierkegaard and Nietzsche—as other examples of the poetic approach. He concludes by offering his own attempts at a poetic approach to addressing philosophical issues.

James C. Klagge is Professor of Philosophy at Virginia Tech and the author of *Wittgenstein in Exile* (MIT Press).

August | 6 x 9, 264 pp.

US \$45.00X/\$60.00 CAN cloth

978-0-262-04583-4

Borders as Infrastructure

The Technopolitics of Border Control

Huub Dijstelbloem

An investigation of borders as moving entities that influence our notions of territory, authority, sovereignty, and jurisdiction.

In *Borders as Infrastructure*, Huub Dijstelbloem brings science and technology studies, as well as the philosophy of technology, to the study of borders and international human mobility. Taking Europe’s borders as a point of departure, he shows how borders can transform and multiply and mark conflicts over international orders. Borders themselves are moving entities, he claims, and with them travel our notions of territory, authority, sovereignty, and jurisdiction. The philosophies of Bruno Latour and Peter Sloterdijk provide a framework for Dijstelbloem’s discussion of the material and morphological nature of borders and border politics.

Dijstelbloem offers detailed empirical investigations that focus on the so-called migrant crisis of 2014–2016 on the Greek Aegean Islands of Chios and Lesbos; the Europe surveillance system Eurosur; border patrols at sea; the rise of hotspots and “humanitarian borders”; the technopolitics of border control at Schiphol International Airport; and the countersurveillance by NGOs, activists, and artists who investigate infrastructural border violence. Throughout, Dijstelbloem explores technologies used in border control, including cameras, databases, fingerprinting, visual representations, fences, walls, and monitoring instruments. Borders can turn places, routes, and territories into “zones of death.” Dijstelbloem concludes that Europe’s current relationship with borders renders borders—and Europe itself—an “extreme infrastructure” obsessed with boundaries and limits.

Huub Dijstelbloem is Professor of Philosophy of Science and Politics at the University of Amsterdam and Senior Researcher at the Netherlands Scientific Council for Government Policy in The Hague.

August | 6 x 9, 288 pp. | 12 illus.

US \$55.00X/\$73.00 CAN paper

978-0-262-54288-3

Infrastructures series

Making & Doing

Activating STS through Knowledge Expression and Travel

edited by Gary Lee Downey and Teun Zuiderent-Jerak

How ten making & doing projects expand STS scholarship through a focus on knowledge expression and knowledge travel in addition to knowledge production.

Making & doing projects expand STS scholarship to include the trajectories of STS knowledge flow beyond the boundaries of the field by actively interweaving knowledge expression and travel with knowledge production. In this edited volume, contributors from around the world present and critically assess ten empirical making & doing projects. They recount how their projects advance STS, and describe how they themselves learn from their interlocutors and the settings in which they do and share their STS work. A coda explains how the infrastructures of STS scholarship are broadening to include practices of making & doing.

The contributors examine and reflect upon their dilemmas, frustrations, and failures, especially when these generate new practices that might not have occurred had their work not taken the form of making and doing scholarship. While each project raises a distinct set of scholarly issues, all of the projects include practices that express STS knowledge through “STS sensibilities” and attach those sensibilities to practices in empirical fields. The projects include one each in Argentina, Taiwan, Canada, and Denmark; two in the US; one in Austria, the UK, and multiple countries in Africa and Asia; one in the US and Latin America; one in the Netherlands and Australia; and one in an international network that includes members from Europe, the Americas, and Australia.

Gary Lee Downey is Alumni Distinguished Professor of Science and Technology Studies at Virginia Tech. **Teun Zuiderent-Jerak** is Associate Professor of Interactive Governance of Health Interventions at Athena Institute, VU University, Amsterdam.

August | 7 x 10, 284 pp. | 15 illus.

US \$50.00X/\$66.00 CAN paper
978-0-262-53997-5

Technology in World Civilization

A Thousand-Year History

revised and expanded edition

Arnold Pacey and Francesca Bray

The new edition of a milestone work on the global history of technology.

This milestone history of technology, first published in 1990 and now revised and expanded in light of recent research, broke new ground by taking a global view, avoiding the conventional Eurocentric perspective and placing the development of technology squarely in the context of a “world civilization.” Case studies include “technological dialogues” between China and West Asia in the eleventh century, medieval African states and the Islamic world, and the United States and Japan post-1950. It examines railway empires through the examples of Russia and Japan and explores current synergies of innovation in energy supply and smartphone technology through African cases.

The book uses the term “technological dialogue” to challenge the top-down concept of “technology transfer,” showing instead that technologies are typically modified to fit local needs and conditions, often triggering further innovation. The authors trace these encounters and exchanges over a thousand years, examining changes in such technologies as agriculture, firearms, printing, electricity, and railroads. A new chapter brings the narrative into the twenty-first century, discussing technological developments including petrochemicals, aerospace, and digitalization from often unexpected global viewpoints and asking what new kind of industrial revolution is needed to meet the challenges of the Anthropocene.

Arnold Pacey is the author of *The Culture of Technology, Meaning in Technology*, and *The Maze of Ingenuity*, all published by the MIT Press. **Francesca Bray**'s recent books include *Technology, Gender and History in Imperial China* and *Rice: Global Networks and New Histories*. She is coeditor of the forthcoming *Cambridge History of Technology*. Both Pacey and Bray are recipients of the Leonardo da Vinci Medal for the History of Technology.

August | 6 x 9, 356 pp. | 48 illus.

US \$40.00X/\$54.00 CAN paper
978-0-262-54246-3

Leveraging Distortions

Explanation, Idealization, and Universal Patterns
in Science

Collin Rice

An examination of how scientists deliberately and justifiably use pervasive distortions of relevant features to explain and understand natural phenomena.

A fundamental rule of logic is that in order for an argument to provide good reasons for its conclusion, the premises of the argument must be true. In this book, Collin Rice shows how the practice of science repeatedly, pervasively, and deliberately violates this principle. Rice argues that scientists strategically use distortions that misrepresent relevant features of natural phenomena in order to explain and understand—and that they use these distortions deliberately and justifiably in order to discover truths that would be otherwise inaccessible.

Countering the standard emphasis on causation, accurate representation, and decomposition of science into its accurate and inaccurate parts, Rice shows that science's epistemic achievements can still be factive despite their being produced through the use of holistically distorted scientific representations. Indeed, he argues, this distortion is one of the most widely employed and fruitful tools used in scientific theorizing. Marshalling a range of case studies, Rice contends that many explanations in science are noncausal, and he presents an alternate view of explanation that captures the variety of noncausal explanations found across the sciences. He proposes an alternative holistic distortion view of idealized models, connecting it to physicists' concept of a universality class; shows how universality classes can overcome some of the challenges of multiscale modeling; and offers accounts of explanation, idealization, modeling, and understanding.

Collin Rice is Assistant Professor in the Philosophy Department at Bryn Mawr College.

August | 6 x 9 x 0.6875, 366 pp. | 23 illus.

US \$65.00X/\$86.00 CAN paper
978-0-262-54261-6

Technology and Society

Building Our Sociotechnical Future

second edition

edited by Deborah G. Johnson and Jameson M. Wetmore

Writings by thinkers ranging from Rokeya Sakhawat Hossain to Bruno Latour that focus on the interconnections of technology, society, and values.

Technological change does not happen in a vacuum; decisions about which technologies to develop, fund, market, and use engage ideas about values as well as calculations of costs and benefits. In order to influence the development of technology for the better, we must first understand how technology and society are inextricably bound together. These writings—by thinkers ranging from Bruno Latour to Francis Fukuyama—help us do just that, examining how people shape technology and how technology shapes people. This second edition updates the original significantly, offering twenty-one new essays along with fifteen from the first edition.

The book first presents visions of the future that range from technological utopias to cautionary tales and then introduces several major STS theories. It examines human and social values and how they are embedded in technological choices and explores the interesting and subtle complexities of the technology-society relationship. Remediating a gap in earlier theorizing in the field, many of the texts illustrate how race and gender are intertwined with technology. Finally, the book offers a set of readings that focus on the sociotechnical challenges we face today, treating topics that include cybersecurity, geoengineering, and the myth of neutral technology.

Deborah G. Johnson is Anne Shirley Carter Olsson Professor Emeritus in the Science, Technology, and Society Program in the School of Engineering of the University of Virginia. **Jameson M. Wetmore** is Associate Professor in the School for the Future of Innovation in Society at Arizona State University.

Contributors

Wiebe Bijker, Rena Bivens, Art M. Blake, Tim Brown, Ashley Carse, Rupak Chakravarty, Gary Chapman, Austin Choi-Fitzpatrick, Lisa Drilling, Richard Dyer, E. M. Forster, Francis Fukuyama, Sara Goering, Niall Hayes, Robert L. Heilbroner, Mar Hicks, Rokeya Sakhawat Hossain, Thomas P. Hughes, Bill Joy, Alice Kaswan, Eran Klein, Bruno Latour, Maria Carmen Lemos, George Lucas, Clark A. Miller, Felicia L. Montalvo, Michael Moss, David E. Nye, Jason O'Leary, Eulalia Pérez Sedeño, Charles Perrow, Trevor J. Pinch, Raoni Guerra Lucas Rajão, Jennifer Richter, George Ritzer, Matthew Sample, Andrew Smith, Jack Stilgoe, Anjali R. Truitt, Dominique Vinck, Rachel N. Weber, Stellan Wellin, Jameson M. Wetmore, David Willetts, Langdon Winner

August | 7 x 10, 592 pp. | 43 illus.

US \$55.00X/\$73.00 CAN paper
978-0-262-53996-8

Inside Technology series

Proxies

The Cultural Work of Standing In

Dylan Mulvin

How those with the power to design technology, in the very moment of design, are allowed to imagine who is included—and who is excluded—in the future.

Our world is built on an array of standards we are compelled to share. In *Proxies*, Dylan Mulvin examines how we arrive at those standards, asking, “To whom and to what do we delegate the power to stand in for the world?” Mulvin shows how those with the power to design technology, in the very moment of design, are allowed to imagine who is included—and who is excluded—in the future.

For designers of technology, some bits of the world end up standing in for other bits, standards with which they build and calibrate. These “proxies” carry specific values, even as they disappear from view. Mulvin explores the ways technologies, standards, and infrastructures inescapably reflect the cultural milieus of their bureaucratic homes. Drawing on archival research, he investigates some of the basic building-blocks of our shared infrastructures. He tells the history of technology through the labor and communal practices of, among others, the people who clean kilograms to make the metric system run, the women who pose as test images, and the actors who embody disease and disability for medical students. Each case maps the ways standards and infrastructure rely on prototypical ideas of whiteness, able-bodiedness, and purity to control and contain the messiness of reality. Standards and infrastructures, Mulvin argues, shape and distort the possibilities of representation, the meaning of difference, and the levers of change and social justice.

Dylan Mulvin is Assistant Professor of Media and Communications at the London School of Economics.

August | 6 x 9, 288 pp. | 30 illus.

US \$45.00X/\$60.00 CAN paper
978-0-262-04514-8

Infrastructures series

Preparing Dinosaurs

The Work behind the Scenes

Caitlin Donahue Wylie

An investigation of the work and workers in fossil preparation labs reveals the often unacknowledged creativity and problem-solving on which scientists rely.

Those awe-inspiring dinosaur skeletons on display in museums do not spring fully assembled from the earth. Technicians known as preparators have painstakingly removed the fossils from rock, repaired broken bones, and reconstructed missing pieces to create them. These specimens are foundational evidence for paleontologists, and yet the work and workers in fossil preparation labs go largely unacknowledged in publications and specimen records. In this book, Caitlin Wylie investigates the skilled labor of fossil preparators and argues for a new model of science that includes all research work and workers.

Drawing on ethnographic observations and interviews, Wylie shows that the everyday work of fossil preparation requires creativity, problem-solving, and craft. She finds that preparators privilege their own skills over technology and that scientists prefer to rely on these trusted technicians rather than new technologies. Wylie examines how fossil preparators decide what fossils, and therefore dinosaurs, look like; how labor relations between interdependent yet hierarchically unequal collaborators influence scientific practice; how some museums display preparators at work behind glass, as if they were another exhibit; and how these workers learn their skills without formal training or scientific credentials.

The work of preparing specimens is a crucial component of scientific research, although it leaves few written traces. Wylie argues that the paleontology research community’s social structure demonstrates how other sciences might incorporate non-scientists into research work, empowering and educating both scientists and nonscientists.

Caitlin Donahue Wylie is Assistant Professor of Science, Technology, and Society at the University of Virginia.

August | 6 x 9, 264 pp. | 12 illus.

US \$75.00X/\$99.00 CAN paper
978-0-262-54267-8

Extracting Accountability

Engineers and Corporate Social Responsibility

Jessica M. Smith

How engineers in the mining and oil and gas industries attempt to reconcile competing domains of public accountability.

The growing movement toward corporate social responsibility (CSR) urges corporations to promote the well-being of people and the planet rather than the sole pursuit of profit. In *Extracting Accountability*, Jessica Smith investigates how the public accountability of corporations emerges from the everyday practices of the engineers who work for them. Focusing on engineers who view social responsibility as central to their profession, she finds the corporate context of their work prompts them to attempt to reconcile competing domains of accountability—to formal guidelines, standards, and policies; to professional ideals; to the public; and to themselves. Their efforts are complicated by the distributed agency they experience as corporate actors: they are not always authors of their actions and frequently act through others.

Drawing on extensive interviews, archival research, and fieldwork, Smith traces the ways that engineers in the mining and oil and gas industries accounted for their actions to multiple publics—from critics of their industry to their own friends and families. She shows how the social license to operate and an underlying pragmatism lead engineers to ask how resource production can be done responsibly rather than whether it should be done at all. She analyzes the liminality of engineering consultants, who experienced greater professional autonomy but often felt hamstrung when positioned as outsiders. Finally, she explores how critical participation in engineering education can nurture new accountabilities and chart more sustainable resource futures.

Jessica M. Smith is Associate Professor in the Engineering, Design, and Society Division of the Colorado School of Mines, where she is also Director of Humanitarian Engineering Graduate Programs.

September | 6 x 9, 328 pp. | 20 illus.

US \$75.00X/\$99.00 CAN paper
978-0-262-54216-6

Engineering Studies series

The Astronomer's Chair

A Visual and Cultural History

Omar W. Nasim

The astronomer's observing chair as both image and object, and the story it tells about a particular kind of science and a particular view of history.

The astronomer's chair is a leitmotif in the history of astronomy, appearing in hundreds of drawings, prints, and photographs from a variety of sources. Nineteenth-century stargazers in particular seemed eager to display their observing chairs—task-specific, often mechanically adjustable observatory furniture designed for use in conjunction with telescopes. But what message did they mean to send with these images? In *The Astronomer's Chair*, Omar W. Nasim considers these specialized chairs as both image and object, offering an original framework for linking visual and material cultures. Observing chairs, Nasim ingeniously argues, showcased and embodied forms of scientific labor, personae, and bodily practice that appealed to bourgeois sensibilities.

Viewing image and object as connected parts of moral, epistemic, and visual economies of empire, Nasim shows that nineteenth-century science was represented in terms of comfort and energy, and that “manly” postures of Western astronomers at work in specialized chairs were contrasted pointedly with images of “effete” and cross-legged “Oriental” astronomers. Extending his historical analysis into the twentieth century, Nasim reexamines what he argues to be a famous descendant of the astronomer's chair: Freud's psychoanalytic couch, which directed observations not outward toward the stars but inward toward the stratified universe of the psyche. But whether in conjunction with the mind or the heavens, the observing chair was a point of entry designed for specialists that also portrayed widely held assumptions about who merited epistemic access to these realms in the first place. With more than 100 illustrations, many in color.

Omar W. Nasim is Professor for the History of Science at the Institute of Philosophy at the University of Regensburg, Germany. He is the author of *Observing by Hand: Sketching the Nebulae in the Nineteenth Century*, winner of the History of Science Society's Pfizer Award for 2016.

September | 7 x 9, 304 pp. | 45 color illus., 59 b&w illus.

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Helmholtz and the Conservation of Energy

Contexts of Creation and Reception

Kenneth L. Caneva

An examination of the sources Helmholtz drew upon for his formulation of the conservation of energy and the impact of his work on nineteenth-century physics.

In 1847, Herman Helmholtz, arguably the most important German physicist of the nineteenth century, published his formulation of what became known as the conservation of energy—unarguably the most important single development in physics of that century, transforming what had been a conglomeration of separate topics into a coherent field unified by the concept of energy. In *Helmholtz and the Conservation of Energy*, Kenneth Caneva offers a detailed account of Helmholtz's work on the subject, the sources that he drew upon, the varying responses to his work from scientists of the era, and the impact on physics as a discipline.

Caneva describes the set of abiding concerns that prompted Helmholtz's work, including his rejection of the idea of a work-performing vital force, and investigates Helmholtz's relationship to both an older generation of physicists and an emerging community of reformist physiologists. He analyzes Helmholtz's indebtedness to Johannes Müller and Justus Liebig and discusses Helmholtz's tense and ambivalent relationship to the work of Robert Mayer, who had earlier proposed the uncreatability, indestructibility, and transformability of "force." Caneva examines Helmholtz's continued engagement with the subject, his role in the acceptance of the conservation of energy as the central principle of physics, and the eventual incorporation of the principle in textbooks as established science.

Kenneth L. Caneva is Professor in the Department of History at the University of North Carolina at Greensboro. He is the author of *The Form and Function of Scientific Discoveries* and *Robert Mayer and the Conservation of Energy*.

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Transformations: Studies in the History of Science and Technology

Genomic Citizenship

The Molecularization of Identity in the Contemporary Middle East

Ian McGonigle

An anthropological study based on ethnographic work in Israel and Qatar explores the relationship between science, particularly genetics, and national identity.

Based on ethnographic work in Israel and Qatar, two small Middle Eastern ethnations with significant biomedical resources, *Genomic Citizenship* explores the relationship between science and identity. Ian McGonigle, originally trained as a biochemist, draws on anthropological theory, STS, intellectual history, critical theory, Middle Eastern studies, cultural studies, and critical legal studies. He connects biomedical research on ethnic populations to the political, economic, legal, and historical context of the state; to global trends in genetic medicine; and to the politics of identity in the context of global biomedical research.

Genomic Citizenship is more an anthropology of scientific objects than an anthropology of scientists or an ethnography of the laboratory. McGonigle bases his untraditional project on traditional anthropological methods, including participant observation. Some of the most persuasive data in the book are from public records, legal and historical sources, published scientific papers, institutional reports, websites, and brochures.

McGonigle discusses biological understandings of Jewishness, especially in relation to the intellectual history of Zionism and Jewish political thought, and considers the possibility of a novel application of genetics in assigning Israeli citizenship. He also describes developments in genetic medicine in Qatar and analyzes the Qatari Biobank in the context of Qatari nationalism and state-building projects. Considering possible consequences of findings on the diverse origins of the Qatari population for tribal identities, he argues that the nation cannot be defined as either a purely natural or biological entity. Rather, it is reified, reinscribed, and refracted through genomic research and discourse.

Ian McGonigle is Assistant Professor of Anthropology and STS at Nanyang Technological University.

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US \$75.00X/\$99.00 CAN paper

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American Independent Inventors in an Era of Corporate R&D

Eric S. Hintz

How America's individual inventors persisted alongside corporate R&D labs as an important source of inventions.

During the nineteenth century, heroic individual inventors such as Thomas Edison and Alexander Graham Bell created entirely new industries while achieving widespread fame. However, by 1927, a *New York Times* editorial suggested that teams of corporate scientists at General Electric, AT&T, and DuPont had replaced the solitary “garret inventor” as the wellspring of invention. But these inventors never disappeared. In this book, Eric Hintz argues that lesser-known inventors such as Chester Carlson (Xerox photocopier), Samuel Ruben (Duracell batteries), and Earl Tupper (Tupperware) continued to develop important technologies throughout the twentieth century. Moreover, Hintz explains how independent inventors gradually fell from public view as corporate brands increasingly became associated with high-tech innovation.

Focusing on the years from 1890 to 1950, Hintz documents how American independent inventors competed (and sometimes partnered) with their corporate rivals, adopted a variety of flexible commercialization strategies, established a series of short-lived professional groups, lobbied for fairer patent laws, and mobilized for two world wars. After 1950, the experiences of independent inventors generally mirrored the patterns of their predecessors, and they continued to be overshadowed during corporate R&D's postwar golden age. The independents enjoyed a resurgence, however, at the turn of the twenty-first century, as Apple's Steve Jobs and *Shark Tank's* Lori Greiner heralded a new generation of heroic inventor-entrepreneurs. By recovering the stories of a group once considered extinct, Hintz shows that independent inventors have long been—and remain—an important source of new technologies.

Eric S. Hintz is a Historian with the Lemelson Center for the Study of Invention and Innovation at the Smithsonian Institution's National Museum of American History and coeditor of *Does America Need More Innovators?* (MIT Press).

August | 6 x 9, 368 pp. | 38 illus.

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Lemelson Center Studies in Invention and Innovation series

The Demonstration Society

Claude Rosental

translated by Catherine Porter

Today, as in the past, public demonstrations are not only tools to prove, persuade, and promote, but also fundamental forms of social interaction and exchange.

YouTube demos of makeup products by famous influencers, demonstrations of strength during street protests, demonstrations of military might in North Korea: public demonstrations are omnipresent in social life. Yet they are often perceived as isolated events, unworthy of systematic examination. In *The Demonstration Society*, Claude Rosental explores the underlying dynamics of what he calls a “demonstration society.” He shows how, both in today's world and historically, public demonstrations constitute not only tools to prove, persuade, and promote, but fundamental forms of interaction and exchange, and, in some cases, attempts to lead the world.

Rosental compares demos with other forms of public demonstrations, drawing out both their peculiarities and common features. He analyzes the processes through which demonstrations are conceived and carried out, as well as the skills of their producers. He also compares contemporary demos with historical demonstrations including theaters of machines in the Renaissance, public demonstrations of natural philosophy in the seventeenth century, and demonstrations of the magic lantern in the nineteenth century. Above and beyond the entertainment they sometimes provide, demonstrations are experienced as intense moments that broadly involve alliances, material and symbolic goods, and, more generally, the future of individuals and collectives. Rosental elucidates the many ways in which we live today, as in the past, in a society of demonstration.

Claude Rosental is Research Professor of Sociology at Centre National de la Recherche Scientifique and a member of the Centre d'Étude des Mouvements Sociaux in Paris.

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Infrastructures series

Farm Fresh Broadband

The Politics of Rural Connectivity

Christopher Ali

An analysis of the failure of U.S. broadband policy to solve the rural–urban digital divide, with a proposal for a new national rural broadband plan.

As much of daily life migrates online, broadband—high-speed internet connectivity—has become a necessity. The widespread lack of broadband in rural America has created a stark urban–rural digital divide. In *Farm Fresh Broadband*, Christopher Ali analyzes the promise and the failure of national rural broadband policy in the United States and proposes a new national broadband plan. He examines how broadband policies are enacted and implemented, explores business models for broadband providers, surveys the technologies of rural broadband, and offers case studies of broadband use in the rural Midwest.

Ali argues that rural broadband policy is both broken and incomplete: broken because it lacks coordinated federal leadership and incomplete because it fails to recognize the important roles of communities, cooperatives, and local providers in broadband access. For example, existing policies favor large telecommunication companies, crowding out smaller, nimbler providers. Lack of competition drives prices up—rural broadband can cost 37 percent more than urban broadband. The federal government subsidizes rural broadband by approximately \$6 billion. Where does the money go?

Ali proposes democratizing policy architecture for rural broadband, modeling it after the wiring of rural America for electricity and telephony. Subsidies should be equalized, not just going to big companies. The result would be a multistakeholder system, guided by thoughtful public policy and funded by public and private support.

Christopher Ali is Associate Professor in the Department of Media Studies at the University of Virginia and the author of *Media Localism: The Policies of Place*. He is a Knight News Innovation Fellow with the Tow Center for Digital Journalism at Columbia University and former Fellow with the Benton Institute for Broadband & Society.

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Information Policy series

Introduction to Urban Science

Evidence and Theory of Cities as Complex Systems

Luis M. A. Bettencourt

A novel, integrative approach to cities as complex adaptive systems, applicable to issues ranging from innovation to economic prosperity to settlement patterns.

Human beings around the world increasingly live in urban environments. In *Introduction to Urban Science*, Luis Bettencourt takes a novel, integrative approach to understanding cities as complex adaptive systems, claiming that they require us to frame the field of urban science in a way that goes beyond existing theory in such traditional disciplines as sociology, geography, and economics. He explores the processes facilitated by and, in many cases, unleashed for the first time by urban life through the lenses of social heterogeneity, complex networks, scaling, circular causality, and information.

Though the idea that cities are complex adaptive systems has become mainstream, until now those who study cities have lacked a comprehensive theoretical framework for understanding cities and urbanization, for generating useful and falsifiable predictions, and for constructing a solid body of empirical evidence so that the discipline of urban science can continue to develop. Bettencourt applies his framework to such issues as innovation and development across scales, human reasoning and strategic decision-making, patterns of settlement and mobility and their influence on socioeconomic life and resource use, inequality and inequity, biodiversity, and the challenges of sustainable development in both high- and low-income nations. It is crucial, says Bettencourt, to realize that cities are not “zero-sum games” and that knowledge, human cooperation, and collective action can build a better future.

Luis M. A. Bettencourt is Professor of Ecology and Evolution, and Inaugural Director of the Mansueto Institute for Urban Innovation, at the University of Chicago. He is also an external Professor of Complex Systems at the Santa Fe Institute.

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