



REVIEWS

Edited by Kate Arneman

INTERVIEW

BRYAN GAENSLER astronomer and author

HAVING JUST RETURNED from the Writers' Festivals in Melbourne and Brisbane to launch CAASTRO (the Centre of Excellence for All-Sky Astrophysics) in Sydney, Bryan Gaensler spoke to reviews editor **Kate Arneman** about what inspired his first popular science book.

KA: Your book is dedicated to your 8-year-old son: "To Fineas for asking questions that I couldn't answer." Were his questions the impetus for writing *Extreme Cosmos*?

BG: He asks questions about everything. When I say, "I don't know", he says, "Why don't you know? Someone must know" and I say "I don't think anyone knows the answer to these questions." It made me realise that, in astronomy, the area I'm an expert in, it's time to sit down and answer these questions, rather than simply say, "No one knows."

Some of the questions he asked, like "What's the biggest star we know of?" or "What's the fastest planet?" are not things astronomers sit down and write papers about. They're not considered scientifically interesting questions



Astronomy can make preposterous statements about what we know about the universe and that's very appealing.

to ask whereas to the public these are, I hope, very interesting questions.

This is your first book. What surprised you about the writing process?

That it's hard! I thought I could write this on plane [journeys] but unless I was connected to the Internet with the whole astronomical literature at my fingertips I could barely write a sentence. I had to recalculate numbers other people had calculated to find out that they had made a few minor errors, I had to keep checking as I wrote to make sure what I'd written about a month ago hadn't been surpassed or made irrelevant.

You've just been to the Writer's Festivals in Melbourne and Brisbane. What kind of a response did you get to the book?

[As an astronomer] you're thrilled when five people in the world read your paper and if one of them cites it. That's the expectation in astronomy,

even with great discoveries there's only a very small number of people who have the technical interest to appreciate what you've done. So the idea that there was a room full of people who had actually read the book and wanted to know more was a very strange feeling. The other thing I realised was there's a very intelligent audience out there.

That must be very satisfying.

It confirmed my belief that astronomy has a very important role to play. Of all the different sciences, it's the one that perhaps has a unique advantage in getting people excited about science. Astronomy does have this special cache. We can make preposterous statements about what we know about the universe and that's very appealing.

Who was the audience you pictured reading this?

I wanted this to be the very first astronomy book you ever read. I wanted the sort of person who normally wouldn't read this sort of book – because there were just too many things they didn't understand in it – to pick up this one and say, "You know what, this actually makes sense. It's not that scary." There are a lot of people who have good will towards science but maybe just don't see it as something that's accessible.

Which science writers inspire you?

It's hard to go past Carl Sagan in terms of sheer eloquence and ability to explain complex concepts in poetic ways. Any time I think I've come up with a nice turn of phrase all I have to do is open up one of his books and remind myself what the gold standard is. He coined the phrase 'pale blue dot'. He wrote a whole book about that – what the Earth looks like from the edge of the Solar System. That concept of the pale blue dot really sums up everything about our place in the cosmos in just three simple, non-scientific words.



DVD

MAN ON EARTH WITH TONY ROBINSON

Directed by Tom Stubberfield, Discovery Channel (2009), \$29.95

FRESH FUEL DRIVES the age-old axiom "adapt or die" further forward – or perhaps in this case, back in time, as host, British entertainer and activist Tony Robinson takes viewers on a journey through 200,000 years of Earth's climate. Traversing subzero temperatures and punishing drought with theatrical panache, Robinson jumps from one historical catastrophe to another, explaining the climatic forces responsible for the extinction of Neanderthals, the collapse of Mayan culture and the plight of the Black Death in Europe. Analysing climate records from the time of the Black Death, Robinson argues that the warmer and wetter environment during medieval Europe provided an opportunity for rats and fleas to thrive – thereby spawning the disastrous pandemic.

But it's not all negative. Robinson makes sure to include some of the success stories as well – one of

which is the adaptive genius of the Inuit culture in Greenland, who survived the Little Ice Age of 1350 AD and whose descendants live to tell the tale today.

Exclusive insider shots of the skeletons of our archaic ancestors, such as the 160,000-year-old 'Herto' *Homo sapiens* fossils, as well as private tours and stunning shots of the remains of cities, art sites and writings, all provide startlingly convincing evidence that climate change was a factor in both the tragedies and triumphs of our ancient ancestors.

– Katy Storch



NON-FICTION

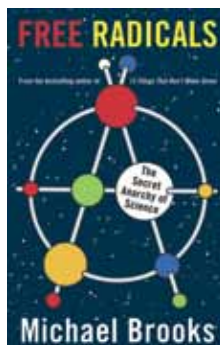
FREE RADICALS: THE SECRET ANARCHY OF SCIENCE

By Michael Brooks, Profile Books (2011), \$29.99

SCIENTISTS ARE human.

That is to say, they are not above the errors of misjudgement that sometimes befall the rest of us. It's a point that author and physicist Michael Brooks forcefully hammers home in his new book.

Following WWII, science underwent a very deliberate and well-planned public makeover, transitioning itself from something suspect, that could wreak havoc and cause mass destruction, into something utterly integral to the future welfare of the developed world. It was a successful rebranding that has since continued, giving



scientists a near godly status as the trusted keepers and dispensers of knowledge.

Brooks argues this rebranding is also a splendid cover-up, for scientists are not always the esteemed figures we perceive them to be, and in some cases, are driven to anarchic extremes to make discoveries, find inspiration or stay atop their respected fields. From lying and cheating, to sabotaging research, performing unethical experiments and taking mind-bending drugs for inspiration, to downright deception, Brooks spills the beans.

And far from condemning these tactics, Brooks very openly and persuasively endorses them. Drug use for instance, can "be invaluable in releasing what lies beneath the conscious mind", he argues. The overarching objective is to make science cool; to remove it from the pedestal we all place it on and reveal that like us, scientists are not infallible. Behind the genius, they are indeed human. It's an interesting take, and a fascinating read I highly recommend. – Myles Gough

COSMOS LOVES



A GREAT ANSWER to the question: what exactly is it that CRCs do? tiny.cc/cxbmq



INSPIRATION, in this International Year of Chemistry, from a women in chemistry event held in August at Parliament House in Canberra:

"Everyone has to push the barrier. One of the most important things we can do is encourage risk taking in women." – Suzanne Cory, president of the Australian Academy of Science

"Sometimes you have to be quite brave; you have to be determined." – Carol Robinson, who left school aged 16, now a

chemistry professor at Britain's University of Oxford.



THIS PASSIONATE, poetic, funny defence of science and critical thinking. Tim Minchin, you rock! *Storm: The Animated Movie* tiny.cc/4hf09



SPRINGTIME!

WHAT'S HOT

NON-FICTION

1. Deep Future: The Next 100,000 Years of Life on Earth by Curt Stager, Scribe, \$32.95

2. Aping Mankind: Neuromania Darwinitis and the Misrepresentation of Humans by Raymond Tallis, Acumen Publishing, \$44.95

3. Everything is Obvious: How Common Sense Fails by Duncan J. Watts, Atlantic Books, \$32.99

4. Brain Bugs: How the Brain's Flaws Shape Our Lives by Dean Buonomano, John Wiley & Sons, \$32.95

5. The Exceptional Brain: And How it Changed the World by Robert M. Kaplan, Allen & Unwin, \$32.99

List supplied by Readings Books and Music, 309 Lygon Street, Carlton www.readings.com.au/carlton

SCIENCE FICTION

1. Mission of Honor by David Weber, Baen, \$13.50

2. Rule 34 by Charles Stross, Orbit, \$32.99

3. Leviathan Wakes by James S. A. Corey, Orbit, \$32.99

4. Saltation by Sharon Lee & Steve Miller, Baen Books, \$13.50

5. Soldiers Duty by Jean Johnson, ACE, \$13.50

List supplied by Galaxy Bookshop, 131 York Street, Sydney www.galaxybooks.com.au

Congrats
to our bookmark
winners who each
receive a waterproof
MP3 player!

BOOKMARK

Covering topics from infinity to intestinal bacteria, the science literature beloved by *Cosmos* readers is a mixed bag.

My most influential books

***Cosmos* (1985) by Carl Sagan**

It opened my eyes to things I found



interesting and caused me to join the SETI@home program. It also led me to Steven Hawking, need I say more! – Peter D. McBain, Warwick, Qld, Australia

***Microcosm: E.coli and the New Science of Life* (2009) by Carl Zimmer**

From the moment I picked up this book it has influenced my thinking about what happens inside a single-celled organism, and how our own challenges are not so different from those facing this seemingly trivial bacterium. – Matthew Dodds, Blue Mountains, Australia

***One, Two, Three, ..., Infinity: Facts and Speculations of Science* (1947) by George Gamow**

Fifty years ago, Gamow's book enthralled me and gave me a flavour for how little science and math I really knew. Obviously brilliant and a Nobel Prize winner, he wrote an informative, understandable, and inspiring book for the layperson. I found it fascinating and later specialised in celestial mechanics. It was definitely an inspiration.

– Harry R. Betz, San Jose, California, U.S.

The book I want to read next

***The Beginner's Guide to Winning the Nobel Prize* (2005) by Peter Doherty**

I'm at the stage in my science career where I am planning further study. Doherty's background in multiple disciplines in science would provide excellent inspiration and advice as to the many opportunities a science degree can offer.

– Catherine Wheller, Melbourne, Australia

***The Origin of Species* (1859) by Charles Darwin**

I'm motivated to read this book because it generated the wildest conflict between science and religion. I know it talks about the evolution of species through natural selection. I just want to see Darwin's whole idea and development. Sure going to be interesting and thought provocative!

– Asogbon Ayodeji, Akure, Nigeria



NON-FICTION

THE ROADMAP TO 100: THE BREAKTHROUGH SCIENCE OF LIVING A LONG AND HEALTHY LIFE

Walter M. Bortz II and Randall Stickrod, Palgrave Macmillan (2011), \$29.95

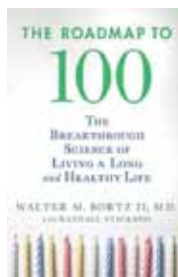
IN A WORLD obsessed by health, books often claim to hold the secret to living a long life. Filled with complicated diets and exercise plans, they can sometimes bear the hallmarks of pseudoscience. In *The Roadmap to 100*, Bortz lays out a refreshingly simple guide to how to live a healthy life.

The book identifies and discusses five key points; the relatively tiny role genetics plays, the preventable consequences of old age, the role of sexual relationships, the role of exercise and the need for social engagement.

While much in the book is common knowledge rather than 'breakthrough science', what Bortz does do is support practical advice with references to scientific research. In doing so, he cuts through the pseudoscience of other 'healthy-living guides', providing a clear framework that the reader can follow.

For example, in discussing antioxidants in the form of specialised pills found in health food stores, he says "literally every fresh vegetable and fruit is laden with antioxidant compounds, not just a handful of specialised species ... It is safe to say that if you eat fresh fruit and vegetables every day, you will get all the antioxidants your body can put to effective use. It is that simple."

The book doesn't come with a guarantee of 100 years of health and happiness, but I don't doubt that by following Bortz you may well live more happily and healthily – without it taking over your life. – Greg Dash



NON-FICTION

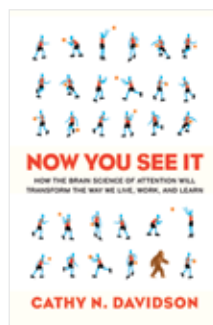
NOW YOU SEE IT: HOW THE BRAIN SCIENCE OF ATTENTION WILL TRANSFORM THE WAY WE LIVE, WORK, AND LEARN

by Cathy N. Davidson, Viking Books (2011), \$42

A LOT HAS CHANGED in 50 years. Schools, workplaces and even the nature of how we work has been fundamentally redefined with the advent of new technologies. Those who have grown up with these new technologies embrace it and continue along their way until another little revolution comes along and we are forced to adapt.

In Davidson's book, we go on a journey through life, starting from birth and continuing through school and the workforce; examining how the focus of our attention has shifted over the years. The author explores how we learn to recognise what is important and deserving of our attention and how that affects us later in life. She redefines and challenges the perception of children who have learning disabilities, suggesting that it's not the kids, but rather the teaching techniques that are outdated and need to evolve, showcasing programs where those diagnosed with 'learning disabilities' have flourished, simply by using changed teaching methods.

Turning to the work environment, Davidson examines how new technology is forcing a change in workplace practices while some still cling to the old ways of the industrial era. She champions innovative ideas and methods that appeal to the individual and persuades companies to come up to speed. – Oliver Chan



NON-FICTION

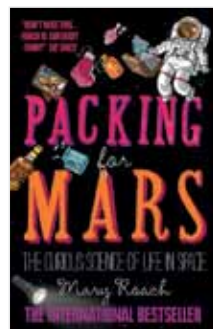
PACKING FOR MARS: THE CURIOUS SCIENCE OF LIFE IN SPACE

By Mary Roach, WW Norton and Co (2011), \$22.95

HAVING READ AND relished one of Roach's earlier books, the cheeky *Bonk: The Curious Coupling of Science and Sex*, I packed this one to read on a long-haul flight. And sitting in the economy class of a jumbo jet turned out to be an apt setting in which to consider the physical, emotional and psychological effects of being in a crowded space without access to fresh air or privacy – the very faintest inkling of what it might be like for astronauts in space.

Think paper sick bags are undignified? What about throwing up inside your space helmet? Worried about deep vein thrombosis? Imagine what months of living in zero gravity does to your body. Feel like throttling your overly chatty seatmate? Think of the challenges of working and living in cramped, isolated conditions for an extended period of time. Curious about the mile-high club? What are frisky astronauts supposed to do?

Roach has a ferociously funny turn of phrase and a strong appreciation of the absurd, both of which are put to good use as she travails the history of space simulations and experiments on Earth, as well as the experiences of those who've spent time in space. – Kate Arneman



NON-FICTION

THE BEST AUSTRALIAN SCIENCE WRITING

Edited by Stephen Pincock; New South Books (2011), \$29.95

LIKE A PHOTO that captures precious memories, this compilation preserves some of the most interesting and appetite-whetting scientific highlights of the year.

In the foreword, Nobel Prize-winner Peter Doherty argues that it has become increasingly difficult to discriminate between legitimate science and self-published opinion in a world where electronic media is now king.

The anthology contains 27 pieces, and the contributors include not only the usual suspects (Tim Flannery, Paul Davies and Karl Kruszelnicki) but also writers not usually associated with science, such as Germaine Greer.

One notable story by Kate Legge, entitled "It's Time to Talk," wades gently through the subject of suicides in Australia. The piece describes a current standstill among pundits – a debate about whether promoting awareness regarding the issue would paradoxically give rise to more suicides. Chilling personal accounts and sharp statistics are scattered throughout the piece – I was in tears by the end.

On a lighter note, *Cosmos'* very own Becky Crew contributes a humorous tale of the sex lives of male gulf pipefish, as well as stories on dust mites and the evolution

of music. Of course, climate change and the end of the world also make the cut – as they should – because, ultimately, the book is meant to offer a snapshot of the scientific thoughts that circulated during 2011. Whether you agree with what is written or not, some of the most recognised Australian science writing of 2011 is there for you to reference for years to come. – *Katy Storch*



NON-FICTION

TRANSIT OF VENUS: 1631 TO THE PRESENT

By Nick Lomb, New South Books (2011); \$49.95

YOU COULD SAY the Australian nation owes its existence to a celestial phenomenon. Every 100 years Venus can be seen passing in front of the Sun from Earth. It can be seen a second time eight years later, before the planets' paths diverge again. Captain Cook ostensibly sailed to the Southern Hemisphere to view the 1769 transit, but he carried a sealed packet of instructions directing him to search for *Terra Australis Incognita*.

Author Nick Lomb takes readers through the science of these events; from Johannes Kepler's first prediction of the transit in 1631 to how Venus is helping us search for Earth-like planets in other solar systems today. He also provides historical context and fascinating insights into the lives of the scientists who observed the transits. The numerous sketches and photographs illustrate both the transitions themselves and just how far technology has come since 1639.

The next transit will take place on 6 June 2012 and the final chapter has practical information on how to view it. After reading *Transit of Venus*, I'll be somewhere near a telescope next year. – *Laura Boness*



TECH: APP EXOPLANET

By Hanno Rein (2011), free for iPhone and iPad, available on iTunes

THE AGE OF exploration is alive and well in space, where a bounty of new worlds are discovered every week. To stay abreast of this expanding real estate, there's the Exoplanet app, available free for iPhones and the iPad. Updated as soon as discoveries are announced, it has diagrams, orbital plots and animations to help you visualise the scientific data of each new planet discovered. You can also plot correlation diagrams, pinch and zoom with your fingers and email the final diagram as a PDF file; plus you get an interactive 3D plot of the Milky Way galaxy. – *Wilson da Silva*



BOOKS
THAT
CHANGE
YOUR
MIND



Extreme Cosmos

Bryan Gaensler

'You have to read this book. First, it's about the most amazing stuff you can imagine, and can't imagine. Imagine a star with a magnetic field so powerful it can wipe your credit card from half-a-million kilometres away. This book deals with the unimaginable extremes of temperature, sound, speed, light, mass, time, electricity, size and gravity through our Universe. Second, Bryan Gaensler was Young Australian of the Year, is having a stellar career is Astronomy/Astrophysics, and is a Professor at the University of Sydney. He's the right person to write about our Extreme Universe.' – *Karl S. Kruszelnicki*

Bryan Gaensler is an award-winning astronomer and passionate science communicator, who is internationally recognised for his groundbreaking work on dying stars, interstellar magnets and cosmic explosions.