Cosmology boot camp

John Gilbey goes on the road in the US far west to refine the science in his fiction.

I was looking for a man with a small dragon perched on his shoulder, but the low atmospheric pressure made even the short walk from the shuttle to the concourse more taxing than I had expected. Above me, the building opened up into a vast, vaulted tent of brilliant white fabric. Beyond the tinted windows, the arid landscape looked almost abstract, a glint of ice visible on the peaks of the distant mountains.

The scene was familiar from a dozen science-fiction novels, but this was no poorly pressurized dome on some airless future world. It was Denver International Airport in Colorado — a mile above sea level on the edge of the Rocky Mountains — and the dragon was a detailed model sported by one of my fellow science-fiction creators. We were meeting there to head northwards together to the Launch Pad Astronomy Workshop at the University of Wyoming in Laramie.

Launch Pad is the creation of Mike Brotherton: astronomer, sci-fi novelist and professor in the physics and astronomy department at Wyoming. Now in its ninth year, the programme is a wildly enjoyable week-long boot camp for science-fiction practitioners determined to get the astronomy and cosmology right in their stories, films, graphics and games. The list of authors associated with Launch Pad as instructors and students includes the likes of Joe Haldeman and Mary Robinette Kowal. They represent a wide range of sub-genres, from hard science fiction to fantasy, and explore subjects from black holes to werewolves.

Laramie — at an altitude of more than 2,100 metres and with a dry, stable climate — is an ideal place to combine classroom and lab activities such as learning the art and science of spectroscopy and Hubble image management with hands-on experience of a range of telescopes. Observing Jupiter's moons as the sky darkened above the Rocky Mountains is an experience that will stay with me for a long time. A visit to the impressive 2.3-metre telescope at the Wyoming InfraRed Observatory is a pivotal part of the course and a brilliant opportunity for the team photo.

After a week grappling with cosmological theory — not the least mind-mangling part of which was dark matter — and just geeking out with Mike, his colleagues and

Launch Pad assistant Tyler Ellis sets up a telescope.

other writers, the workshop came to an end. Alone, I headed west by train through the Rocky Mountains — a welcome digital detox after immersion in technology, through glorious, almost Martian scenery. Thirty-three hours later I was decanted into the intellectual maelstrom of California's Silicon Valley, keen to discover what the wider science community thinks of science fiction.

A scale model of the Fermi Gamma-ray Space Telescope hangs in the foyer of the Kavli Institute for Particle Astrophysics and Cosmology (KIPAC) on the sandstone hills above Stanford University. It is framed by translucent marker boards covered in the arcane glyphs of the trade. This space and the neighbouring SLAC National Accelerator Laboratory could easily serve as the set of a hi-tech sci-fi blockbuster. KIPAC director Tom Abel spent time with me describing the multi-threaded nature of the institute's work in the search for dark matter and dark energy. Parallel streams of research with a common goal are rarely seen in science fiction — especially in films, where science is frequently simplified.

Kludgy science in fiction does not bother

Abel. "I actually practise suspending my criticism as much as possible in order to maximize the enjoyment," he told me with a smile. Stories of future human society appeal to him. "I keep looking for the philosophical, the sociological, the human dimensions — there are so many challenges there, balancing individual fulfilment with a million-year timescale." I began wondering whether hard-science researchers prefer social-science fiction, and decided that further research would be needed.

A couple of miles away, on a busy street corner in Palo Alto, the non-profit research organization Institute for the Future treads an intriguing line between science futures and science fiction in providing "practical foresight for a world undergoing rapid change". Mike Liebhold, a distinguished fellow at the institute, is in the forecasting business. As he tells me, "One of the most productive methods we use is provocation, to help people take a much narrower focus than merely plausible futures, and actively engage in shaping their desirable futures." He walked me around the centre's frenetic creative space. "I'm trying to understand how humans can orchestrate automation and digital technology," he notes — a theme common to many a sci-fi plot.

As a writer in my late fifties, I am frequently tripped up by the sense of living in my past-future, surrounded by both the shiny futuristic gadgets and the dark dystopias that my younger self read and wrote about. (Compare, for instance, the Newspad in Stanley Kubrick's 1968 film *2001: A Space Odyssey* and the handheld communicator in the original series of *Star Trek* with today's tablets and smartphones.) Now, more than ever, I believe that the project management of our collective future needs to work across science cultures to gain from all the vitally creative contributions available. By fostering the inclusion of sound science in future fiction, events such as Launch Pad help to build mutual awareness between science practitioners and science speculators. This will help us to work towards the goal of a secure future for our species and home planet. ■

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