

about – and also less. The colours I thought I saw, the blues, reds and yellows, must be in my mind, like dreams, because atoms were colourless. What else might be only in my mind then, and not "out there"? How could I ever know how things really were, I wondered.

The fact that science helps us distinguish between the way things seem and the way they are seemed extraordinary to me then – and now. This feeling grew as I became more sophisticated, culminating, perhaps, when I finally got to study relativity and quantum mechanics and saw how many of our deepest intuitions about the world fell dead and lifeless in front of modern science.

Eventually, I embarked on a PhD in philosophy, concentrating on philosophy of science. This makes sense to me. I have some serious explaining to do, though, at least to myself, about why in addition to being a professor of philosophy I am also a novelist. I once had a procedure to follow before I allowed myself those disreputable things, novels. How can I justify producing them?

I have come to believe, over the years, that literary fiction is remarkably suited to grappling – as philosophy and science grapple – with the difficulties of reconciling objective truth with inner points of view.

Science is always adding to, and sometimes changing, our view on what objective reality is like. When those modifications are radical, there is a time lag in bringing our world view into line, and sometimes we never fully succeed. So it is that we have struggled to come to terms with, say, the devastation of our view of time that was wrought by Einstein.

Time is so fundamental a concept, not only in the objective scientific world view, but in our inner worlds, where time flows ineluctably, no matter what scientific revolutions may come our way. Almost all of our emotions – hope, fear, anticipation, worry, excitement, regret, nostalgia, remorse, resentment – presume the linearity of time.

Can we make art that reflects on the world with which we've been presented by our ever more powerful sciences? Can we explore what these discoveries mean in human terms? Richard Powers's *The Time of Our Singing* meditates on the non-linear notion of time in the very structure of the story he tells. I tried to do something similar in *Properties of Light: A Novel of Love, Betrayal and Quantum Physics*, though, as the sub-title signals, I dwell more on the disruptions to our natural ways of thinking prompted by quantum mechanics, by ideas such as quantum non-locality and entanglement.

Relativistic time, quantum non-locality: abstract ideas indeed, and yet ideas that, once

understood, radically transform one's take on the world, and one's take on oneself in the world. Can a novel's layered reality – striving to present not only the way things are, but the way things appear, the way things feel – help us to understand the human meaning of our scientific truths, the ways those truths can modify our view of ourselves in the universe?

More than ever, science is pushing at us from every side – not just physics but the behavioural sciences, genetics and neuroscience – forcing us to revise what it means for us to be in the universe. It's the job of the novelist not only to engage with that challenge but, more pressingly, to present what it feels like to be so engaged. The novel's wondrous capaciousness allows it to take on all of these dimensions in the quest towards knowing the world.

And science and art are not quite as far removed as the so-called "two cultures" often presume. We're not plunging our fists straight into reality in pursuing the sciences, but rather modelling reality. This modelling is an imaginative work. I've always taken pleasure in Einstein's remark that if he were exceptional in anything it was as a fabulist. As fabulists, both artists and scientists not only call on their imaginations but also rely on aesthetic criteria of beauty and elegance to guide them in their work.

The fact that mathematicians and scientists so often appeal to beauty or

elegance often comes as a surprise to non-scientists. When I write about scientific or mathematical ideas – not just in my fiction but in works like *Incompleteness: The Proof and Paradox of Kurt Gödel* – I always try to bring out the beauty of these ideas, not only to make them more appealing and palatable to non-scientific people, but simply because, well, they are beautiful and beauty ought to be seen and admired as widely as possible.

Writing about scientific themes in fiction naturally means creating characters who are scientists. While the artist has often been

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represented in art as a hero, the scientist is rarely so. I happen to believe that there is something noble about the scientific enterprise, about submitting oneself to the discipline and openness to falsification, about the often single-minded passion.

There is something lofty and inspiring in the enterprise itself, and to the extent that people honestly and steadfastly engage in that enterprise, a bit of the loftiness can't help but cling to them. "There is a grandeur in this view of life," Darwin said, allowing himself an emotional response to his theory of evolution.

And so, I would argue, there is a grandeur in the lives of those who pursue a clear-eyed scientific view. I don't mean to idealise scientists as people. Of course, I know all about the pettiness and rivalry, the childishness and egotism that stubbornly cling, along with the grandeur, to the greatest of scientists. This only makes them more interesting to me as characters, though. Their very contradictions serve as a means to learn something interesting about human nature.

Ever since I finally gave in to the story-loving side of my own nature, I've felt myself lucky to be able to help myself to scientific ideas for my themes and characters, trying to do justice to the beauty of the theories, the grandeur (and pettiness) of the lives, hoping that by doing so I can draw the "two cultures" just a little bit closer to one another. ●



When she was a child, Rebecca Goldstein made herself read a "good-for-me" book before starting a novel

Rebecca Goldstein has received numerous awards for fiction and scholarship, including a MacArthur fellowship. Her non-fiction books are on Baruch Spinoza and Kurt Gödel. Her fiction includes *The Mind-Body Problem* (Random House), *Strange Attractors* (Penguin) and *Properties of Light* (Houghton Mifflin). She is working on a new novel, *The Afterlife of Skeptics*, on science and religion