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The man who makes physics sexy

His 78-page book has outsold *Fifty Shades of Grey* in his native Italy and won rave reviews worldwide. Meet Carlo Rovelli the scientist they're calling the new Stephen Hawking

David Aaronovitch

December 17 2016, 12:01am, The Times

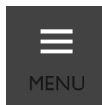


Carlo Rovelli on the terrace of his house in Verona
MATTIA BALSAMINI

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What I know about physics isn't worth knowing. Or wasn't. I was taught old school, measuring the speed of a wooden trolley under the instruction of a colourless, ageless man whose voice never quite managed the full range of a monotone. I achieved the lowest grade of fail at O level and never glanced back.



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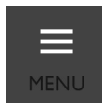
made me feel horribly temporary. Even the planetarium would inspire a sensation in the lower abdomen not unlike looking down from too great a height. I spared myself the bother of reading *A Brief History of Time* by the unusual act of not actually buying it.

Then *The Times* suggested that I fly out to France to interview the new Hawking, an Italian physicist whose paperback entitled *Seven Brief Lessons on Physics* has attracted extraordinary praise from very sensible book reviewers, outsold *Fifty Shades of Grey* in Italy, has worldwide sales probably reaching one million in the new year, and – above all – is only 78 pages long. Intimidated, I agreed to go out and meet Carlo Rovelli.

I am not going to pretend that I understood all of his book. But what I did understand was somehow gorgeous. I wondered why on earth my teachers hadn't begun teaching physics with the concepts in the first four lessons – relativity, quantum mechanics, particles and space. I had imagined (“thought” would be too dignified a word here) that space was empty – hence the word “space” – and that things travelled or communicated in a continuum of matter. Particles existed, had a life, and then ceased to exist in my imagined order of things. Rovelli the author showed me why it was all so much more interesting than that. He wrote about particles only existing at the moment of interaction and of time being an illusion.

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‘I didn’t care at all about university. It was a way of avoiding compulsory

This last concept helped me when it turned out that his newest book, *Reality is Not What It Seems: the Journey to*



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book, only now published in Britain because of the success of the later but actually earlier book. Got that? And I read that too, since it deals with Rovelli's own specialism, quantum gravity, and if you want to know what that is, buy it.

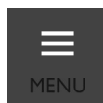
Seriously, buy them both. The writing is luminous. By the time I had finished reading I was in serious awe of the author.

The small, slightly dishevelled and smiling man in sweatshirt, jeans and flip-flops who bounds down the steps to meet me is not my physical idea of a scientific genius. Carlo Rovelli wears his grey hair tousled and looks 40 rather than 60. He lives in a first-floor apartment in the seaside town of Cassis, 20 kilometres from Marseilles. The large balcony has a view over the town to the château and then, beyond that, the great bluff of Cap Canaille, a sudden wall of golden cliff above the Mediterranean. Somewhere in the port is his small wooden boat.



Rovelli at home
MATTIA BALSAMINI

Rovelli was born in Verona in 1956, at a time when Italy was entering



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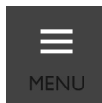


unlike the Italian stereotype of a man,” says Rovelli. His mother, who came from “hidden, hidden, hidden Jewish origins”, was “very intelligent” but had been through a traumatic period at the end of the Second World War when the area in which she lived had been torn apart by a vicious civil war between partisans and fascists. She had had only one child, Carlo, and had “poured all her love” into this one son. Carlo rewarded her by becoming “extremely rebellious”. His family, he says, “were middle class, white, conservative - nice people, but they were not what I wanted”. From the age of 13 onwards he was in perpetual conflict with his mother. From 15, he would disappear on a series of trips, on one occasion hitchhiking from Paris to Sofia, “to see what communism was like”.

He was bad at home but good at school. Italy, he explains, has no competition in the classroom. You don’t come top or bottom of the form. Since the boy he sat next to in class was one of the brightest in northern Italy, Rovelli simply imagined himself to be above average. Nothing special.

Above all, however, he felt alienated. “I was confused,” he recalls. “I felt that no one cared about the real problems. That everybody was lying; that there was this total hypocrisy. I wrote bad poetry; I filled notebooks with all kinds of considerations. I would walk around the parks of Verona at night talking to myself. I wanted to know the truth. It was very adolescent.”

At this point his rather ethereal-looking and beautiful partner, Francesca - also a theoretical physicist - appears with coffee and chocolate nuts and then disappears again. Rovelli is not married and has no children and perhaps, it occurs to me later, the brilliant only



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Rovelli's rebellion became more serious when he went to study at the University of Bologna. Like me, he was a Seventies left-wing student activist, but Italian activism at that time was a very different creature from its staid British counterpart. At Bologna, Rovelli was part of an Occupy movement which, in effect, closed down the university altogether for several months. Wasn't this closure a blow to someone as bright as him? "No! I didn't care at all about university. I was reading enormously; I was travelling, having experiences. University was a way of avoiding compulsory military service."

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‘Quantum gravity says space
and time are not what we
think they are; there’s
something else’

We would back then
have called Rovelli an
“ultra leftist”. As a
striking student he
co-wrote and published
a book about the
protests that got him

into trouble with the police because “there was a continuity between us and the part of the movement that evolved into what became the Red Brigades and the armed extreme left”.

The Red Brigades were Italy's Baader-Meinhof; a terrorist group that, between 1970 and the early Eighties, robbed banks, carried out kidnaps and murders, and in 1978 infamously abducted and then murdered the former Italian prime minister, Aldo Moro. Did Rovelli know anybody who went down that path? "Yes. I was pretty close. I would never have shot anybody, but there was a sense we were strongly on the same side.



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wonderful. They were some of the most clean, honest, gentle, generous, humanity-loving people you can imagine. It's hard to connect the two things. It's hard to digest."

He himself expected to be arrested and charged with giving verbal support to criminal activities (such as drug-taking) or insulting the state, so he went into hiding at an uncle's place in Turin, having told everyone that he was going to Venice.

This rebellious past is obviously important to Rovelli's sense of himself. How on earth has a Seventies rebel become one of the world's top theoretical physicists? In the first place, he tells me, he was tired and scared by a polarisation between the government and the fringes that left no political space for people like him. And in the second place, yes, he had had an epiphany. "At this moment, when I was feeling detached, I totally fell in love with science – that was a BOOM!"

(When he says, "BOOM!", Rovelli booms. He is an animated interviewee. It is like being at the best dinner party you can imagine, sitting next to the chattiest guest, and our interview is punctuated with laughter and giggles. We are having fun.)

In 1976, he spent six months hitchhiking alone from the Atlantic to the Pacific coast of Canada. As his friends went east to find themselves in India, he went the other way.

"I think that was the turning point of my life," he says. "I realised that living as a vagabond was not the greatest life. When I came back I had to study for my exams. And then I realised I was pretty good.



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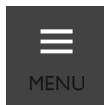


physics and it was fantastic! Physics shows the reality beyond the reality. It is a way of thinking that keeps changing. It is a way of thinking that acts by questioning the questions. Where you discover that space is different from what you thought, that time is different from what you thought. There was a revolutionary side to physics that I responded to.”

Now Rovelli the scientist was motoring and his teachers had noticed. One called him in and suggested that it was time to put away the marijuana, the free love and the politics and become something.



Rovelli giving a TED talk at Lake Como, 2012
TED TALKS



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when Rovelli entered the examination room there was only one professor there, “a silent, serious, extremely good Italian physicist of few words. And I had this desire to show him that I was following everything, but I never seemed to be able to break through to him.

“He asked a question and I didn’t know how to answer. Then another, and I didn’t know how to answer that one either. He said, ‘Try.’ I thought, ‘You old bastard,’ and I struggled through. Then he said, ‘Leave the room while we discuss your grade,’ which didn’t make any sense, because he was alone. When I came back, he told me that I was the only person to whom he’d awarded the maximum grade.”

Now Rovelli knew what his life’s work would be. He would be a theoretical physicist. “It sounded great. It looked good somehow; I wanted to be like those people.” At 24, after being smitten by a 70-page article by a British physicist, he decided that his field would be the emerging science of quantum gravity - essentially the effort to reconcile the contradictory theories of general relativity and quantum mechanics. At that time he would be the only person in Italy working in the field.

“Quantum gravity says that space and time are not what we think they are; there’s definitely something else. So what is it? This is on a very small scale. If I could become smaller, smaller, smaller, what is down there? What is the minute structure of things? The scale of quantum gravity is 10^{-33} cm and I took a piece of paper and wrote that and put it up on my wall in Bologna.”

At that point, of course, he loses me. Down, down, down I get. Ten to



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clever, beguiling man thinks that this is important and “fantastic” and if I knew enough about it I’m sure I’d think so too.

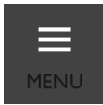
It is getting dark outside. The lights of the port are twinkling. Rovelli tells me how, when he was in America teaching in Pittsburgh, a literary agent had suggested that he write a popular book on physics. But he’d declined. “I had better things to do,” he says. “I had serious physics books to write.” One book on quantum gravity was published in 2004 and another, updated, in 2014.

And by now Rovelli, who always liked to tell a story, was ready to meet his public. He had written a series of articles for Italian magazines and these were collected together as *Seven Brief Lessons on Physics*. Its success was, of course, a surprise to him.

But look, I say, doesn’t all this get you down? In his *Lessons on Physics* he ends up suggesting that mankind “will not last long”. “We belong to a short-lived genus of species. All our cousins are already extinct ... The brutal environmental and climate changes that we have triggered are unlikely to spare us.” Turtles, he points out, are far better equipped for survival than we are. And he’s not bothered. Indeed, he seems slightly surprised by my anxiety.

“
‘I don’t want to have to deal
with eternity; I just want to
be finite and mortal and to
enjoy this window in time

“Don’t you think that we
don’t need to be central?
That we don’t need to be
important? To be
eternal? I don’t want to
have to deal with
eternity; I just want to



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comprehension



and enjoy this window in time and space and comprehension. That thought is much more relaxing. It makes me more serene!”

It is time to go. We have spoken for more than two hours. Rovelli drives me to the airport, a trip of over an hour, telling me on the way about a boozy night on the town in Verona with a papal nuncio. On the way back, he tells me, he will listen to the new Le Carré audiobook.

I don’t think I’ve ever liked anyone so much on first acquaintance as Carlo Rovelli. From the moment he bounds down to meet me at the electronic gate of his apartment block, smiling and laughing, offering bread and cheese and maybe some olives, to the moment we part five hours later at Marseilles airport.

Before we leave his apartment I plan to ask Rovelli three physics questions arising from his books. One is to do with space, one to do with the existence of particles and the third to do with time. When I ask my first question, I can see it’s a rather dim one and he is mildly disappointed. But the second, he says, is “an excellent, excellent question!” and he lights up as he responds. I never ask my third question. Aaronovitch’s third law of physics: quit while you’re ahead.

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