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The Chronologist

To explain his new theory of time, a physicist turns to pop culture.

Sean Carroll's office at Caltech is a jumble of brainy flotsam. There are books with titles like *Differential Forms in Algebraic Topology*; five empty champagne bottles, one for each of his students who's earned a PhD; and a NASA-approved blow-up beach ball of the universe. And on the physicist's computer screen is a graph of the narrative progression of the time-bending movie *Memento*. "*Memento* does this combination of flashbacks and reverse chronology," he says excitedly. "The later scenes are played in reverse chronology, the earlier scenes are played in ordinary chronology, and they meet up." ¶ In January, Carroll will release his own pop take on the complexities of time with his much-anticipated debut book, *From Eternity to Here: The Quest for the Ultimate Theory of*

Time. Armchair Einsteins will geek out on his audacious thesis. He argues that our perception of time is informed by entropy—the level of disorder in a system—and that the movement from low to high entropy as the universe expands establishes the direction

in which time flows. Furthermore, he posits that our cosmos may be a relatively young member of a large family and that in some of our sibling universes time runs in the opposite direction. Some others, he argues, don't experience time at all; once a universe cools off and reaches maximum entropy, there is no past or present. ¶ Abstract enough for you? That's where Carroll's common touch comes in. His writing is accessible and peppered with cultural references—quotes from *Dumb and Dumber* and *Slaughterhouse-Five*, for instance. But don't be fooled by his mass-market approach: Carroll isn't afraid to wade into topics that have befuddled even name-brand physicists. Though we may deal daily with time's quotidian realities—deadlines and bus schedules and aging—most of us have trouble thinking about how it might exist outside our own experience of it. "We're so used to the arrow of time that it's hard to conceptualize time without the arrow," he writes. "We are led, unprotesting, to temporal chauvinism." —AMY WALLACE

