**SPECIAL ISSUE** **CANADIANS WHO MADE A DIFFERENCE**

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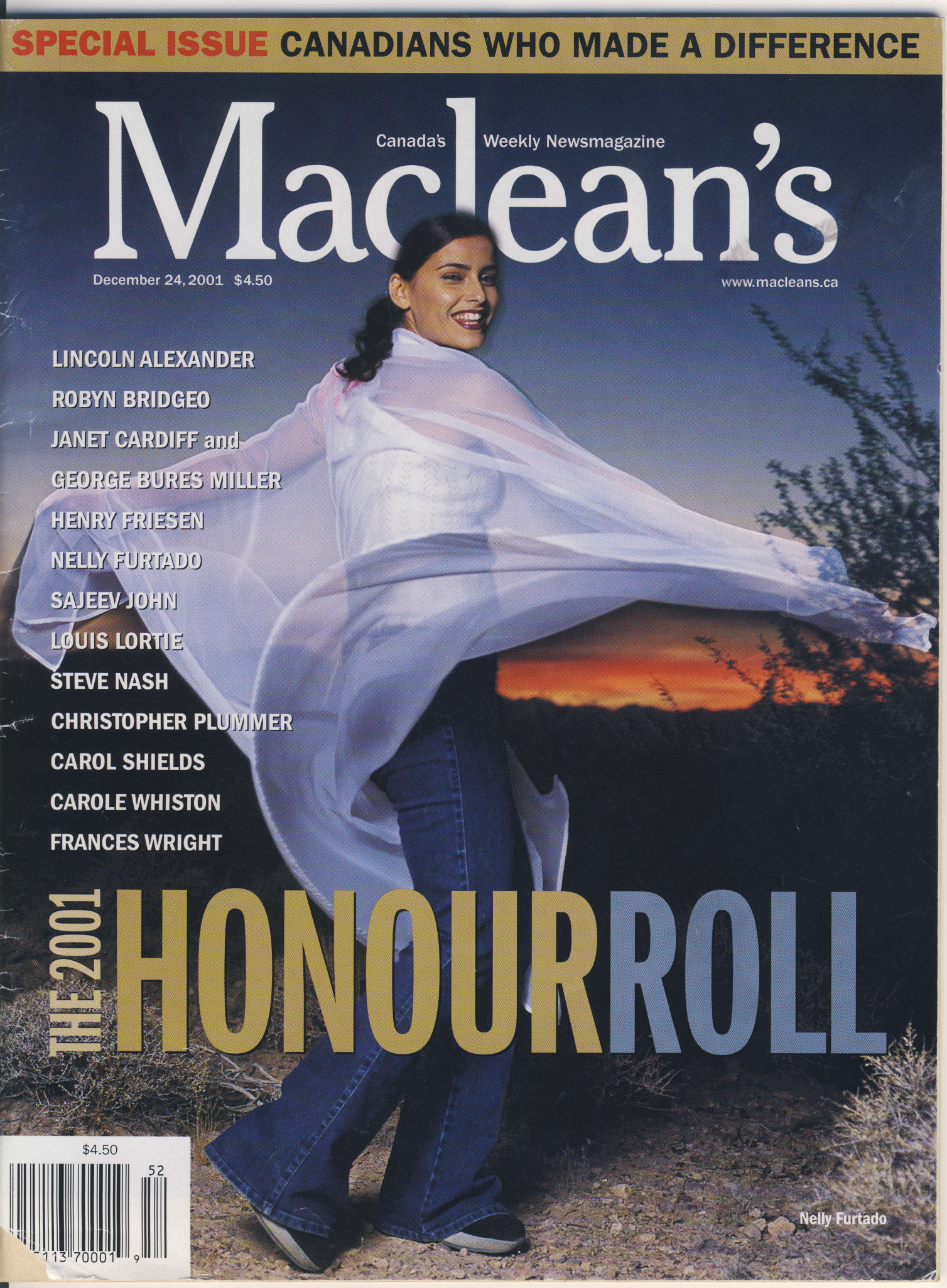

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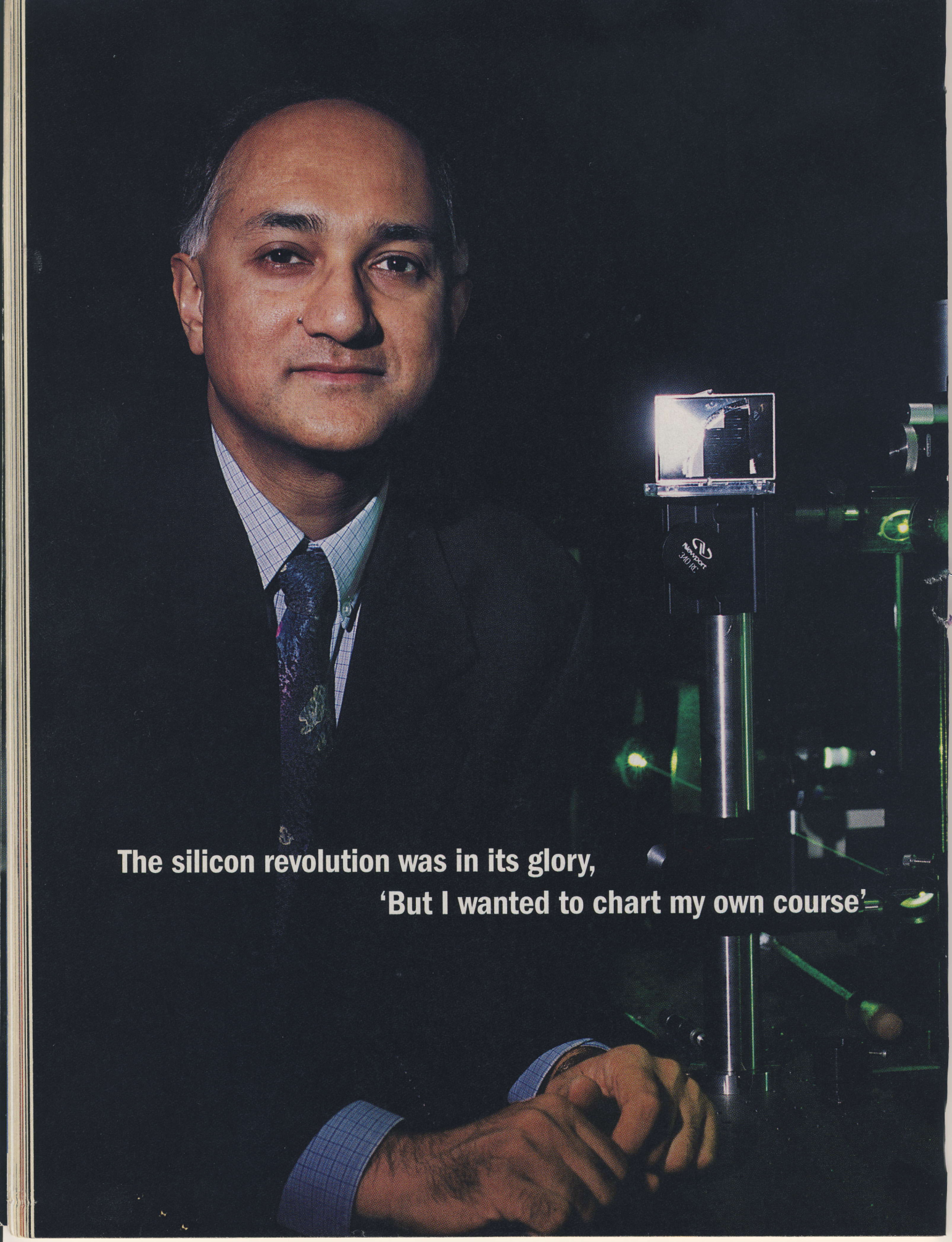
The silicon revolution was in its glory,
'But I wanted to chart my own course'

# SAJEEV JOHN

A modest man with a great big idea, Sajeev John drives an old Pontiac and seems genuinely surprised that a visitor might find his office at the University of Toronto—with its industrial-strength carpet and painted concrete walls—just a little spare. Of course, John, 44, is a theoretical physicist, a numbers guy, someone who lives in a different realm than most. And, if his colleagues are right, he is about to usher in an entirely new world order altogether. Call it the Age of Light, photonics to the scientifically initiated. For John has created both the intellectual framework and a tiny sliver of manufactured silicon so pure, so opalescent, it can actually *cage* light, that quickest and most elusive of agents, and force it along a manmade path.

The potential is enormous: computers and telecommunications ripping along at the fastest speed science knows. "There is nothing in nature that captures light fully," he says, almost wistfully. The way he has done it—by improving on the light-absorbing structure of crystals and butterfly wings, *and* by cajoling a far-flung team of international specialists to join the cause—is nearly as audacious as the idea itself.

John's creed is that discovery means "exposing your ignorance." And his secret is to be so unassuming that he can broker his ideas among a diverse group of chemists, materials engineers and general disbelievers. The only child of a physics professor and a biochemist, John himself is a pretty smart cookie. As an undergrad, he topped his class at the prestigious Massachusetts Institute of Technology. The silicon revolution was in its glory. "But I wanted to chart my own course," he says, to make light do what electrons do naturally, follow a manmade path.

His eureka came early. In a paper he wrote in 1984, when he was just 27, John set out his theory for containing light. More important, how to do it. All of a sudden, scientific doors cranked open. Within a few years, the University of Toronto called him home, dangled research money and allowed him the freedom to travel the world explaining his theories. In early 1999, he met a group of Spanish scientists who were making tiny little balls of glass, a fraction the width of a human hair. That offered him the mould—imagine a miniature crate of oranges barely touching each other.

And back home, at the U of T, John stumbled upon chemist Geoffrey Ozin who was willing to try, literally, to fill in the gaps. Ozin, at first, thought it couldn't be done. But John is persistent, a cajoler. In just over a year, his informal 14-member international team had their triumph. Big corporations came calling; this summer John won the $325,000 King Faisal International Prize for science, an auspicious award from a desert kingdom that should know something about light and revolutions.

John is proud but nonplussed by the attention—photonic chips are still some years away from mainstream production. He is already turning his mind to light-reading medical tools—"kind of like Star Trek"—and he is almost as proud that young researchers from all over are flocking to his side: "I've probably made about a dozen new Canadian citizens," he chuckles.

Meanwhile, he has a toddler at home and now an intellectual one making its way in the scientific world. The thought makes him nostalgic. When *he* was 4, his family emigrated from a small village in southern India. He still remembers the canopy of coconut trees that shaded the sky and the almost magical light that filtered through, bouncing and shimmering as light will do. "Light like that remains with you forever," says John. Of course, if you squint your eyes and think real hard, you just might make it dance through hoops.

**BY ROBERT SHEPPARD** • PHOTOGRAPHY BY PETER BREGG