From the Editors

Where the Rubber Meets the Road

Isabel Beichl, Editor in Chief

Back in 1992, I decided to take a bike trip that started in Portland, Oregon, and ended in San Diego, California. As I expected and hoped, it turned out to be a wonderful adventure. At this point, you might be thinking, "That's nice, but what does it have to do with computing, science, and engineering?" The answer is, "plenty." On that trip, I began my journey with brand-new top-of-the-line tires. Although they were completely shot by the time I reached San Diego, they did make it without falling apart. In 1995, I did the California segment of the trip again and experienced three flat tires in the course of roughly two weeks of riding. Then, things started to change in the world of bike tires: by the time I did the trip in 2007, I had no flats. In fact, I continued to use the same set of tires for quite a while afterward.

What happened? Obviously the quality of tires had improved dramatically. Part of the improvement was due to better design, part was due to better materials, and no doubt part was due to the increasing popularity of bicycling that generated an increase in profits to be made by selling bike tires. For readers of *CiSE*, the improvements in design and materials are worth contemplating. Bike tires have been around for a long time, but unlike car tires, stunt drivers can't really stress test them. And, of course, there are no bicycling crash dummies. (Well, actually there are, but you know what I mean.) What appears to have happened is that car tire makers developed extremely sophisticated computational studies of tire materials and design, and the bike tire department said, "Hey, we can use that, too!"

The industrialized world is full of examples like this—extremely high-quality items that got to that point because of computational science. Sometimes the computational models are borrowed from existing work on other products. Unlike dramatic paradigm shifts, such as advances in medicines for treating serious illness or vastly improved climate modeling, these items are more of the everyday variety, such as very nice ceramic dishes that are hard to break and cheap pens that don't seem to wear out. As teachers and practitioners in computational science, we would do well to keep in mind how much our subject benefits the world. Naturally, not *every* example of computational modeling works out well (think technical investing) but many, many do.

So if any of you have interesting applications of computing in the real world of science or engineering, please write to isabel dot beichl at nist dot gov and tell me about it. And the next time you open a tube of toothpaste and find it to be much better than the one you had before, remember that it might be because of something you did.