

Let's Have Some Letters to the Editor!

What's the sum of $\sin(n)/\log(n)$ from $n = 2$ to ∞ ? I love this kind of problem, where there's not much hope of a closed-form solution so you have to do your best with numerical approximations. Along the way, you can learn a lot. Admittedly, not all mathematicians enjoy this kind of thing, but *Chacun à son goût*, as my grandmother used to say, which she told me means "Some people like one kind of goo and some people like other kinds of goo."

I assigned this problem to our Numerical Analysis Problem Solving Squad at Oxford last autumn, challenging them to find the answer to ten digits of accuracy. To get ten digits by summing the series directly, you'd need to take about $10^{1000000000}$ terms, so I imagined the students would explore various algorithms for accelerating convergence. I had a trick of my own to show off—multiplying the oscillations by a smooth tanh cutoff window and letting its transition band widen systematically to infinity, which leads to beautiful convergence that can be proved using contours in the complex plane.

FROM THE SIAM PRESIDENT

By *Nick Trefethen*

Sure enough, the students came up with some clever mathematics. But even cleverer were their Internet discoveries. In particular, they tried typing the problem into WolframAlpha. Well, I'd done that too, and in fact I had picked this particular series because WolframAlpha couldn't seem to sum it. The students outfoxed me.

They discovered that although WolframAlpha can't find a numerical sum for $\sin(n)/\log(n)$, it does just fine with $\exp(in)/\log(n)$. From there, to get the answer to the original problem, they just had to take the imaginary part!

There is no doubt about it, we have entered a world where our machines often know more mathematics than we do. Who can say what algorithm WolframAlpha is using? Somebody must know, and maybe I could figure it out by reading around in the documentation; but of course, most of us most of the time don't take the trouble. It is all too efficient to try this and try that among the many e-tools at our disposal, and more and more often, one of these attempts gives us what we want. When I was starting out, computers were deterministic, but now they're pretty well along the track to being intelligent and unpredictable. You may think this is a bad thing, but you can't stop it. We scientists and mathematicians ride the wave like everybody else, trying to do our part to guide it as we ride it.

We're all in this together, this exploding world of science and technology, with its worries and thrills. Somewhere in your jungle of Facebook, Twitter, iTunes, radio, television, e-mails, blogs, and texts, there is a retro little newsprint publication called *SIAM News*, and we hope it gives you some pleasure. We do not aspire to be up to the millisecond, but as a small step toward greater interactivity, some of us have been thinking it might be interesting for *SIAM News* to publish more Letters to the Editor. We begin the experiment in this issue with a collection of letters from readers on an assortment of topics.

Is something on your mind that might be of wide interest to SIAM members? By all means e-mail a letter about it to siamnews@siam.org. A good length is 200 words. Please remember, not every contribution can be published, and the editor may shorten your letter.

The editor of *SIAM News*, incidentally, is a superwoman called Gail Corbett. Gail has been putting together every issue of this newspaper for quite a few years now, and most of us involved in SIAM operations are a bit in awe of her. She is ably assisted by Carol Mehne.

I don't agree with all the letters in this issue. In particular, David Gleich makes the suggestion that we could speed up journal publication by discouraging referees and editors from demanding so many revisions. That's true, probably, but I think the opinion of most SIAM editors would be that we must not even hint at asking editors or referees to cut corners, for the greatest strength of SIAM journals is their peer review, which is certainly not perfect but on balance very good. A letter to the editor that disagrees with the views of the president? Shocking!