

# TAKING THE NANOPULSE

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## Six to watch in '12

**A look back at 2011 nano-topics, pointing the way in 2012**

BY SCOTT E. RICKERT

It's been a year, hasn't it? Not always as good as we'd hoped, but never as dark as we feared. My take? We've learned. And with that knowledge, we're moving on. That's why this month I'm making some prognostications about 2012 by revisiting our hottest topics in 2011.

The #1, #2 and #3 Nano-Topics to Watch in 2012 are the same as for 2011: globalization, commercialization and partnership – as I reported from Zurich, Cyprus and Boston gatherings. It's clear that we can't talk about one without the others – the SWOT analysis brings them all to the table. Is it a threat to America's technology leadership? An opportunity for our innovators? A call for more government funding? A plea for less interference? All that and more.

So my advice for 2012? Get on with it. The world is going to keep getting flatter. That's why I've been to talk business in India, the Middle East and Europe during the fourth quarter. Others are doing the same. This month India announced a NanoPark near the Mumbai airport to serve the 50+ nanocompanies there looking for worldwide commercialization partners. China held a conference in October for 500 R&D, industry, government and investment leaders to explore public-private commercialization partnerships -- including a couple of America's best-known consumer and nanotech names – plus companies from Japan, Iran, Israel, Germany and Korea.

And what about funding for commercialization in the U.S.? The 2012 Obama administration budget, with its \$2.1 billion for nanotechnology, still languishes in Congress, and the 2013 version is likely to face the same fate. It's an important facet to the jobs creation plans in the government's Advanced Manufacturing Partnership program, so it may get at least some of the attention it deserves.

But here's the really interesting development that happened in November. The National Nanotechnology Initiative made a formal response to questions about commercialization progress from the President's Council of Advisors on Science and Technology (PCAST). Some pundits suggest PCAST was challenging the value of the billions

of tax dollars already invested. The good news? There was plenty to say. Speakers reeled off activities for some 7,800 projects, touching all 50 states and involving 15 agencies, from the Department of Defense to the National Institutes of Health.

There's cause for concern, of course. A university nanotechnology institute warns that other countries are building (and spending!) to rival our government program. Lux Research cautions that Europe may surpass the U.S. in nanotechnology-enabled products by 2015 unless we take an aggressive commercialization stance.

Still, there's plenty of encouraging commercialization news. Nanomedicine and environmentally friendlier nano-enabled batteries, both topics we explored here in 2011, continue to have breakthroughs.

Hot topic #4 in our nano review was how nanotechnology is making hydraulic fracturing, or "fracking", for oil and natural gas faster, easier – and more environmentally friendly. Despite recent concerns about a Wyoming location, statistics count seven billion barrels of oil and 600 trillion cubic feet of natural gas in safe results. And, I'd bet my bottom dollar that future eco-improvements will be nano-enabled ones.

That's the perfect segue to Topic #5: environmental health and safety concerns. Work by the EPA, FDA and other regulators continues apace, as do the efforts of private industry. While I saw a flurry of panic early in the year, the mood now is calm, focused and reasonable.

We need to keep it that way – because of Topic #6: nano-terrorism. Remember September's column about the package bomb mailed to nanotech faculty at a Mexico university? I had expected to call an "all-clear" -- until December 7. That's the day another professor in Mexico suffered minor burns from a letter bomb. No one has yet claimed responsibility and authorities aren't ready to speculate – or even name the addressee. And, while the college is installing metal detectors, no one is slowing down their research.

So let's close out 2011 on a positive note, too, by a stop by the geek-chic nanotechnology t-shirts we donned in July's column. Favorite then: "Nanotechnology. Don't sweat the big stuff." New favorite: "Grey Goo. There's greater risk from the back of your fridge." The perfect sentiment for a Happy Nano New Year greeting.

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