**…protecting cities from nuclear threats, developing portable neutron radiography, and enabling massive scientific simulations in an hour on your desktop…**

I'm Vincent Tang, a Program Manager here at the Defense Sciences Office. I've always been fascinated by the possibilities and challenges offered by nuclear technologies. I came to DARPA to create programs that would have a large, positive impact in this area. I've been here three years now, and in that time I've created three programs. Let me tell you a little bit about each one.

The first is SIGMA, aimed at making massive sensor networks feasible both technically and operationally, for continuous city-scale monitoring of nuclear threats. Think thousands to ten thousand networked sensors in a region. I'm very excited about the progress we have made on this—from developing sensors that are nearly an order of magnitude better than the state-of-art while costing only $400/unit compared to thousands of dollars, to getting on the ground for real operations. We're having a huge impact already and are well on our way to making SIGMA a reality.

The second program is ICONS, which stands for Intense and Compact Neutron Sources. ICONS aims to make neutron radiography as easy as taking an x-ray. This is important because neutrons can see a lot of things that x-rays can't see easily—for example, the explosives inside of shells. To do that we are making compact accelerators with new nanocomposite materials that allow us to pack a large amount of voltage in a small space—letting us shrink an entire laboratory neutron source to something you and I can carry. We'll be entering the second phase of the program soon to build prototypes of these accelerators.

The third program, which is just ramping up, is the Accelerated Computation for Efficient Scientific Simulations program, or ACCESS. ACCESS is about new and better ways to perform scientific simulations. Simulations are a huge part of how we do science and engineering nowadays, and they provide great value for both design and for discovery. The problem, though, is the complex simulations we want to run require large computing clusters. What's more, many problems are just not easily parallelizable within that traditional multi-core, digital, architecture—this means some of these simulations we want to run can take up to a month! We want to change that fundamentally. We are exploring novel analog and digital architectures that could allow us to run those same problems on your desktop, in under an hour. If we can do that, I think we will open up all sorts of possibilities for understanding complex systems and phenomena—everything from plasma dynamics, to new materials, to climate modeling.

It's been a tremendously exciting opportunity to be at DARPA. One of the best parts about this job is working with all of you to build something that changes what is possible. So keep at it and keep bringing us your best ideas to change the world!

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