

Looking further and deeper.

The Square Kilometre Array – SKA for short – is one of the most ambitious science projects of all time. Made up of 3000 radio telescopes spread over a distance of 6000 kilometres, it promises to unlock some of the deepest secrets of the universe.

Right now, the excitement of the science is somewhat overshadowed by the disappointment of learning that New Zealand and Australia failed in our bid to jointly host the 1,500 million Euro array. Winning would have meant jobs, money and probably a lot more of our young people pursuing a career in science.

But for all that, New Zealand has already scored a major coup thanks to SKA – and we stand to gain even more than hosting the array could have offered.

Here's why.

SKA will generate unimaginable amounts of data – more than 1 Exabyte of data per day, or enough to fill 54 million iPods every 24 hours. No one has yet figured out how to process that deluge of raw data and turn it into useful information.

Once we do figure that out, the world will never be the same.

That's because the world is *already* swimming in oceans of data. Somewhere within it are solutions to some of our most pressing problems, including how to feed the world, how to manage global warming, and how to make the most efficient use of limited energy resources.

How come we can't find those solutions now? Because the human brain, while smart, isn't fast enough to crunch through all the data we have; and computers, while fast, aren't yet smart enough to tell us what the raw data might mean. We're smart but slow; they're fast but dumb.

A small team of New Zealanders may have come up with a way to marry the intelligence of human beings with the sheer number crunching power of machines. In a highly oversimplified nutshell, the team developed a way to “map” intuitive human thinking onto machines – a bit like taking the world's best problem solver and souping up his or her brain with unimaginable processing power. Or, for the more dramatically inclined, like creating Einstein on steroids.

The team developed this solution – actually more of a way *towards* a solution – specifically for SKA. But its application extends to every area of human activity that involves making sense of data. In other words, transport, health, manufacturing, environment, food production, and so on and so on.

This wasn't your usual team. It was a collaboration between business (IBM), academia (Victoria University and a Kordia SKA scholarship at AUT) and the New Zealand Government. Such collaborations are almost unheard of in New Zealand – and rare elsewhere.

Here's what makes this truly exciting for New Zealand Inc.

The solution developed for SKA can be developed further, and reconfigured for specific industries

in order to earn this country massive income. To take just one example, the global aluminium industry consumes about eight percent of the world's electricity. You'd think it would therefore be highly efficient in its electricity use – but it's not. The problem, as you've probably guessed, is that production plants generate so much data every second that it's impossible for all but the very best human operators to make enough sense of it to keep the plants running optimally.

New Zealand could now be the first country to develop a solution to that problem. We would then own the intellectual property – and the rewards in export dollars would be potentially massive.

Now repeat that for all other major industries. And for transport. And health. And so on.

But it won't happen automatically. The solution will only be developed through collaborations like the one used for SKA. It's critical that such collaborations are agile (typical “big” science and/or big business projects are slow and cumbersome, with numerous stakeholders). New Zealand has first mover advantage here, but it won't last long. We must move quickly to establish a model for future, fast moving collaborations made up of carefully selected participants. Whether we do this through PPPs or some other method is up for grabs. What's critical, however, is that it does happen.

It's not going too far to say that New Zealand's future prosperity could be at stake here.

With an effective model for collaboration, we can produce the same work for our own industries (dairy is grappling with how to produce more milk from each hectare of land without degrading rivers or soil) and export *those* solutions to the world. And we can do the same for health, transport, telecommunications and even business challenges like data-driven marketing.

But it will take that overworked word “vision”, coupled with commitment from business, academia and government. And serious investment.

Will New Zealand do it? We certainly hope so. It's a remarkable opportunity that could set us on the path to a vibrant future, where our wealth is generated not only by what we extract from the land, but the value we create with our brains.