AUSTRALIA’S CHIEF SCIENTIST

PROFESSOR IAN CHUBB

MATHS OF PLANET EARTH LAUNCH

10-15 MINUTE SPEECH

SIDNEY MEYER ASIA CENTRE,

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Good evening.

It is a pleasure to be here.

My year generally begins with a string of openings, welcomes or launches and I am glad that it does.

However overly optimistic, each New Year brings with it the hope of progress, change and improvement.

This comes in many typical forms, from culling chocolate from our diets, spending less on online shopping, or in my case not wasting time on bad wine. But it is always based on a resolution to eliminate, or at least minimise, a personal vice.

2013 marks the International Year of Maths on Planet Earth and so we begin with the hope to refute the reputation of maths as irrelevant or esoteric.

Students share a similar complaint about math lessons year after year: “When am I ever going to use this?” Followed closely by “Why do I need to know this?”

And sadly, too often I have heard anecdotes where the answer is: “for the exam”.

But an understanding of mathematics is more than a tool to pass exams, more than a pathway to good grades and university entry rankings.

Mathematics is all around us.

It underpins almost everything we touch and everything we see.

Engineering, physics, chemistry, geology, statistics are all dependent on mathematics.
It is fundamental to the commerce on which our society depends and is at the root of much modern medicine.

Mathematics underpins our understanding of epidemics, of finding oil, of climate change risk, of tsunami warnings, of the internet.

And yet so many people struggle to see its relevance to their world.

Somehow (I say hopefully) we must explain to the world at large why it is important.

Explain that there are some amongst our cohort of scientists, mathematicians, engineers who will devote their time and their skills to the understanding of the very nature of things.

We must explain that there are others who will use that knowledge, add to it, mould it and turn it into applications that benefit humankind.

All are valuable, all are critical indeed, and all will play their part in meeting some of our challenges head on.

Because the challenges we face are not small. Food security, climate change, population growth, sustainability and ageing populations are challenges that will be dependent on the work of mathematicians, as much as physicists, ecologists and epidemiologists.

I’m heartened that the organisers of the International Year of Maths of Planet Earth also incorporated economics, politics and social sciences. The challenges facing us cannot be solved without them. But we have no shortage of economists or politicians – though some might wander about that. What we do face is both
dwindling interest, and a dwindling number of professionals in the field of mathematics.

Demand in Australia for maths graduates has outstripped supply. Between 1998 and 2005, demand for mathematicians and statisticians in the Australian economy grew by 52% – an annual growth rate of 5.4%. Forecasts up to 2013, project an expected growth rate of 3.6%[i].

And yet in the period 2001 to 2007 the number of enrolments in a mathematics major in Australian universities declined by approximately 15%[ii]. Projected figures state that by 2020, there will be more mathematics PhDs retiring from the Australian workforce than entering it. This is in spite of the predicted 55% increase in demand by 2020 for mathematics and statistics PhDs across all sectors of the economy[iii].

On the global scale, we are falling further and further behind. In 2003, before the decline just mentioned, the percentage of students graduating with a major in mathematics or statistics in Australia was 0.4%. The OECD average was 1%[iv].

So what can we do about it? We need to increase the number of people taking on maths in universities, now. Which means we also need to increase the number of students taking high level maths in schools, now.

Last year, the Prime Minister committed $54 million to a suite of recommendations prepared by my office to increase science and maths enrolments.

The funding is still being divvied up, but one of the most important recommendations was the appointment of a mathematics and science education and industry advisor.

Just before Christmas, it was announced that Dr Roslyn Prinsley would take on the position. Dr Prinsley is a science
educator, a plant biologist and an agricultural policy and research adviser.

She is well aware of the challenges that lay before her, and importantly, she understands the importance of science and innovation to Australia’s prosperity and to global challenges.

Perhaps the greatest task she faces is to get the community behind us: to show people that maths is vital to improvements in their everyday lives – all the time.

A survey we commissioned found that of the year 11/12 students not studying science in 2011, only 4 per cent thought science was ‘almost always’ useful in everyday life while 60% thought it ‘never’ or only ‘sometimes’ useful; 1% thought it relevant to their future ‘almost always’ while 42% thought ‘never.’

It is not difficult to imagine similar conclusions would be found for mathematics.

The view that maths is irrelevant, or of no use, permeates widely.

But this idea of ‘impractical maths’ is a fallacy – the work of mathematicians over the last fifty years, even in what we think of as obscure realms of maths, has had an enormous impact.

I hope that this year, with the activities planned and the awareness it will generate, will help people across the world appreciate the role maths plays in every aspect of their lives.

The world we have constructed, and the way we interact with the natural world around us is a clear and ubiquitous example of the importance of mathematics to our lives and I am pleased to officially launch 2013 as the International Year of Maths of Planet Earth.
Before I introduce the speaker, I would like to acknowledge the Simons Foundation. Their generous financial support has allowed an international series of public lectures to be a key part of this important year. We thank them for their support.

Let me now welcome Professor Levin to the stage to present the first in that international series of public lectures: “the challenges of sustainability and the promise of maths.”

Professor Levin received his B.A. from Johns Hopkins University and his Ph.D. in mathematics from the University of Maryland.

Until 1992 he was at Cornell University. Since then, he has been at Princeton University, where he is Director of the Center for BioComplexity.

Professor Levin has been widely awarded for his seminal work in mathematical biology.

His work aims to understand the parallels between ecological systems and economic systems, particularly with regards to what makes them vulnerable to collapse.

Professor Levin.


