


# THE POWERFUL IMPACT OF BASIC SCIENCE

*Step 1: Invest in research, especially in physics and the basic sciences. Step 2: Nurture a culture of science. The result: Innovation that drives development.*

 by Fernando Quevedo



Fernando Quevedo, a Guatemalan national, is director of The Abdus Salam International Centre for Theoretical Physics. He obtained his PhD from the University of Texas, Austin, in 1986. After research appointments at organizations such as CERN and the Los Alamos National Laboratory, he joined the University of Cambridge, UK, in 1998, where he is professor of theoretical physics and Fellow of Gonville and Caius College. He was elected a TWAS Fellow in 2010.

Theoretical physics and pure mathematics are often ignored in discussions about the importance of science for development and the well-being of society, and tend to suffer from a lack of funding. This is in spite of the fact that these fields claim some of history's top scientists, including Newton, Einstein, Feynmann and Hawking. Theoretical ideas sometimes lead to life-changing products, but the process often takes years and the end result is rarely predictable. That should not stop countries, rich or poor, from supporting basic sciences. History has shown that this is one of the best investments they can make.

Theoretical research has been the driving force behind some of the most important technological developments of the past century. Wireless communication, optics, lasers, integrated circuits, GPS, nanotechnology: the list of discoveries is impressive and ongoing. Yet few know of the theorists behind these modern conveniences. Bringing theory to reality takes a concerted effort between theorists, experimentalists and applied scientists, which is only achieved if there is a well-established culture of science.

The recognition of theoretical physics and its importance to development is particularly crucial to those countries that need development the most but can ill afford huge

investments in science. ICTP founder Abdus Salam recognized this fact years ago when he set out to promote science in the developing world. By supporting the study of theoretical physics, a field that requires little more than a brain and appropriate working conditions, Salam managed to plant the seeds of science programmes throughout the developing world. Following Salam's vision has helped many developing countries to nurture a scientific culture in which a small, fragile, but usually active scientific community promotes research based on tools essential to scientific culture: analytical thinking and problem-solving. These are very much needed in developing countries.

The big challenges of the present and future – such as climate change, energy and health – affect developing countries disproportionately, and they need to have the background knowledge to tackle these problems. Establishing a culture of science is a crucial first step. It starts by having a critical mass of highly qualified individuals who, with the support of policymakers, should be able to address the challenges affecting their countries or regions.

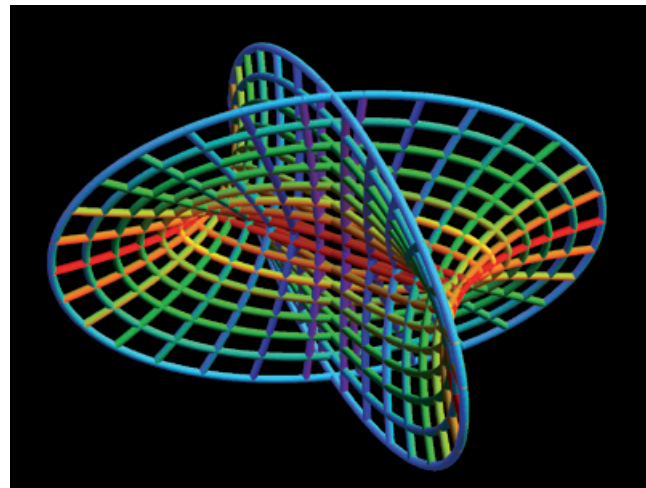


Image courtesy: Dr. Elizabeth Slavkovsky

Neglecting basic science would be unfair not only to those attracted to its intellectual appeal, but also to future generations. After profiting from the discoveries made in the past, we can leave a legacy of healthy support for basic science to our children's children that could guarantee better living standards in the future for all. ■