

## Lessons learned

Half a century of developing mathematical methods for describing the world around us has provided much insight in what the character of Applied Mathematics should be and what purpose it should serve. These experiences can be gathered in the following ‘lessons learned’:

- = Applied Mathematics is the science of developing a universal language and “toolkit” to describe, better understand (and hopefully improve) the world around us.
- = In Applied Mathematics, newly developed methods and algorithms must be tested on real-life applications (in contrast to academic model problems).
- = Do realize that the application-owner had to deal with the problem for a long time, and has gathered much understanding of it. Acknowledge that they know much more about their problem than you do, and use this knowledge for your scientific advantage. Thus, it will not be a surprise that ...
- = ... innovations in Applied Mathematics are strongly stimulated, not to say enforced, by the extra challenges of real-life applications. In other words:

“Necessity is the mother of innovation”  
*(free after Aesop - ancient Greek storyteller)*

- = A long-lasting cooperation with the world outside Academia can only be achieved and maintained when your scientific position is state-of-the-art, well ahead of the existing (open source and commercial) methods.
- = And probably the most important lesson:  
When communicating with the real world, use every-day language, avoiding mathematical jargon as much as possible. Only in this way you can build up sufficient trust, so that industry might support your, hopefully problem-solving, explorations of the scientific unknown.

Acting according to the above ‘lessons learned’, an Applied Mathematician has the whole world (and universe) at his/her feet: from applications in space, in the atmosphere, at sea, along the coast and even inside the human body. Who wants more ...