

# Preface

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**By Máire Geoghegan-Quinn, the  
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Innovation and Science.**

The mathematical sciences have been central to our civilisation for centuries. The global economy and Europe's knowledge society have placed information and communication technologies at the forefront, and these technologies are increasingly dependent on scientific research driven by mathematics.

Mathematics also provides the tools to help us understand and interpret the world around us. It also helps us predict trends in the economy, the environment and demography that are essential to tackling many of the grand challenges faced by our society.

This is especially true in areas where innovation is contributing to a better society, such as health, security, communications, and environmental stewardship. The search for new life-saving drugs, the development of high-performance materials, continued miniaturisation in electronics, and the protection of sensitive ecosystems - all of these activities, and many others, are strongly dependent on fundamental research, and that research is inextricably linked to mathematics.

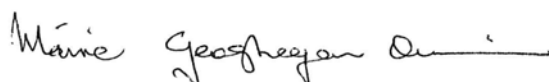
Europe has some of the world's best mathematicians, and in many European universities and research centres, they are often organised in research communities along national lines. In collaboration with industry, they have developed great expertise at the forefront of maths research. They are also participating in a number of research centre networks, exchanging students in joint training programs in industrial mathematics. This is a European scientific community in the making, and the diversity of approaches and cultural differences is an important factor in the cross-fertilisation of ideas produced by European cooperation.

This book presents a number of success stories that demonstrate the crucial contribution of mathematics to innovation in products and technologies. Each story describes the challenge that led to industrial cooperation, how the challenge was tackled and how the solutions were achieved and implemented. Taken together, these stories illustrate the extensive European landscape of projects in almost all areas of applied mathematics and across all business sectors. Close collaboration between industry experts and academia was both crucial to the success of the projects and highly valued by all the participants.

We are increasingly reliant on science, engineering and technology to help boost innovation and economic growth and to improve our quality of life. With this reliance comes a growing need for

improved education and training in mathematics and statistics, both for the scientific and technical workforce and for the general public in an increasingly technological and digital world.

There are great benefits to be gained from a dynamic mathematics community working actively with industry and business. I hope that the examples included in this publication will serve as inspiration for the development of a coordinated and dynamic community of industrial and applied mathematicians in Europe. They have an important role to play in helping to foster Europe's competitiveness and prosperity.



European Success Stories in Industrial Mathematics

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