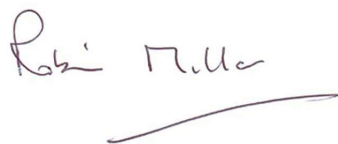

Foreword

Physics is driven by curiosity. What are the things we see in the material world around us, what can they do or have done to them, and how can we explain their behaviour? Learning physics is also driven by curiosity – which is why practical experience plays such a key role. We get curious about something we observe, but often need to look at it more closely to try to see exactly what is happening. Sometimes we have an idea about why something happens, but need to test it by seeing if our predictions are borne out in practice.

A good demonstration connects observations and ideas. It ensures that students are ‘minds on’, even though they are not ‘hands on’. It starts by planting a question in students’ minds – or focusing on a question they are already asking. It stimulates curiosity by showing something that is surprising, or fascinating, or beautiful. And it leads towards an explanation of what is observed. The demonstrations in this book show all of these characteristics. One that I always enjoyed using as a school physics teacher we called ‘pearls in air’ (in this book, ‘Zwevende pareltjes’). It uses a vibration generator to break a fine jet of water into droplets which you then observe using a strobe lamp. This lets you ‘freeze’ the motion, so that you can look more closely at the gaps between the droplets and see that they are equally spaced horizontally, but their vertical spacing decreases as they rise and increases as they fall. By changing the strobe frequency a little, you can then create the illusion that the drops are going backwards into the nozzle – and explain why it looks like this. And you can adjust the frequency to make the water jet emerge in slow motion, allowing you to observe, and to marvel at, the beautiful way in which a continuous stream of water breaks into pieces which become spherical drops – raising more questions to be curious about.

I hope the ideas in this book will stimulate you to want to try some of these demonstrations out, first for yourself to get them to ‘work’ as you want, and then with your classes. Practice and preparation are essential, as ever. The way a demonstration is ‘staged’ matters. But there is ample ‘pay off’ in the interest and enjoyment of your students.

Enjoy!



Robin Millar

