Chris **Lawn**

Teitl Swydd: *Athro Peirianneg Thermohylifau, Queen Mary University Llundain*
Cymwysterau: *MA mewn Ffiseg Theoretaidd a PhD mewn Peirianneg (Prifysgol Caergrawnt)*

Rwyf angen mathemateg bob dydd i ddisgrifio'r prosesau peirianyddol yr wyf yn eu hymchwilio, fel y gallwn ddatblygu gwell dyluniadau ar gyfer pob math o offer. Ac wrth gwrs rwyf hefyd yn ei defnyddio i ddysgu'r genhedlaeth nesaf o beirianwyr.

Treuliais bron i 30 mlynedd mewn ymchwil diwydiannol, y rhan fwyaf ohono gyda'r Bwrdd Cynhyrchu Trydan Canolog. Ar ôl cyfnod byr yn Rolls-Royce Aerospace, penderfynais ddychwelyd at fy ymchwil fy hun a chymryd fy swydd bresennol.

Mae un o fy mhrif ddiddordebau'n ymwneud â thyrbinau nwy diwydiannol mawr sy'n cael eu defnyddio'n gynyddol i gynhyrchu ynni. Problem barhaus yw'r sŵn uchel sy'n cael ei greu gan y fflamau yn y siambr hylosgi. Gall y rhain gyseinio yn y system a chynhyrchu dirgryniadau o'r llafnau tyrbin sydd yn gallu eu difrodi. Drwy ddatrys yr hafaliadau sy'n disgrifio lledaeniad tonnau acwstig, ynghyd â'r rhai sy'n disgrifio prosesau rhyngweithio â'r fflamau, rydym yn gallu proffwydo amlder cyffroad, ac awgrymu mesurau adferol.

Mae craidd theoretaidd fy ymchwil beirianyddol, wrth gwrs, yn fathemategol. Yn benodol, datrysiad hafaliadau differol yw rhan o greu model mathemategol. Felly, heblaw am gyfnod canolig ble roedd fy ngwaith yn bennaf reolaethol, rwyf wedi defnyddio mathemateg yn weddol ddwys drwy gydol fy ngyrfa.

"Rwyf wedi defnyddio mathemateg yn weddol ddwys drwy gydol fy ngyrfa."

Chris **Lawn**

Job Title: *Professor of Thermofluids Engineering, Queen Mary University of London*
Qualifications: *MA Theoretical Physics, PhD Engineering (University of Cambridge)*

I need mathematics every day to describe the engineering processes that I am researching so that improved designs of equipment can be suggested. And of course I also use it to teach the next generation of engineers!

I spent nearly 30 years in industrial research, mostly with the Central Electricity Generating Board. After a short time at Rolls-Royce Aerospace, I decided to get back to my own research and took up my current position.

One of my current interests relates to the large industrial gas turbines that are being used increasingly to generate power. A persistent problem has been the generation of high intensities of sound by the flames in the combustion chamber. These can resonate in the system and produce vibrations of the turbine blades that are potentially damaging. By solving the equations describing the propagation of acoustic waves, together with ones describing the processes of interaction with the flames, we are able to predict the frequencies of excitation and suggest remedial measures.

The theoretical core of engineering research is, of course, mathematical. In particular, the solution of differential equations is part of constructing a mathematical model. Therefore, I have used maths fairly intensively throughout my career, apart from a middle period when the tasks were primarily managerial.

"I have used maths fairly intensively throughout my career."