

HERIOT-WATT UNIVERSITY

L A U R E A T I O N

PROFESSOR MARIA ESTEBAN
BY PROFESSOR JOHN BALL • FRIDAY 21 JUNE 2019

Chancellor, I have the honour to present for the Honorary Degree of Doctor of Science, Professor Maria Esteban.

Maria is a mathematician, an international authority on nonlinear partial differential equations, the calculus of variations and mathematical physics. If you want to do research in mathematics then there is no better city in the world to choose than Paris, and that is where Maria studied for her doctorate, under the supervision of the Fields Medallist Pierre-Louis Lions, and where she has spent all her academic career, currently as CNRS Director of Research (Classe Exceptionnelle) at the University of Paris, Dauphine.

But Maria was born, and studied as an undergraduate, in the Basque Country, to which she is fiercely loyal, and where she frequently returns to visit her family – one of her sisters was a Minister in the Basque government – and to foster scientific connections.

Some of Maria's most influential mathematical work concerns the description of the behaviour of elastic bodies immersed in fluids. In another strand of her research she has studied critical points for an energy functional associated with various nonlinear Dirac equations in relativistic quantum chemistry, and minimizers for the Skyrme's model in chromodynamics. These are very challenging problems involving nonlinear partial differential equations. Unlike in life, in which inequalities are to be avoided, for such equations inequalities, expressing that one quantity is less than another, turn out to be fundamental. Maria is responsible for many important developments concerning such inequalities, and this week we have had the pleasure of hearing her give a stimulating course of lectures describing this and other aspects of her research, together with other talks by two of her international collaborators Gabriela Tarantello and Michael Loss, whom we welcome here today.

She has been a frequent visitor to Heriot-Watt, through which she has many friends and colleagues. For example, as long ago as 1981 she was a co-organiser of an instructional course on nonlinear partial differential equations under the auspices of the International Centre for Mathematical Sciences. That centre, jointly run by Heriot-Watt and Edinburgh Universities and now located in a beautiful new building in the center of the city, was then in its infancy, and courses such as the one Maria organised placed it firmly on the international mathematical map, and on the path to becoming the highly regarded research centre that it is today.

Maria is far more than a very talented mathematician and she has made exceptional contributions to the international scientific community through senior administrative roles. She currently has the great distinction of having been elected President of ICIAM, the International Council on Industrial and Applied Mathematics, which in particular organises every 4 years the most important international congress in applications of mathematics, taking place this summer in Valencia. That she is in such demand for such positions of responsibility is no accident, and reflects not just her good sense but also her commitment, her fine judgement and her willingness to take difficult decisions when needed.

Maria has been a great friend for over 40 years, and the ups and downs of our lives have been shared on many occasions. She was staying with Sedhar and me in Edinburgh the day we were married, and waved us goodbye as we drove off to Glasgow for the private ceremony. All who know her value her warmth, friendship and sense of fun.

Thus today we honour a remarkable woman, both for her deep mathematical contributions and for the influence she has had on mathematics worldwide.

Chancellor, in the name of the University and by the authority of the Senate, in recognition of her standing as a world leading applied mathematician, of her fundamental contributions to mathematical physics and nonlinear partial differential equations, and as a role model for women in Science, Technology, Engineering and Mathematics, I call upon you to confer the Honorary Degree of Doctor of Science on Professor Maria Esteban.