# EDITORS' FOREWORD

*Since the Middle Ages steel takes an important place in the industrial development of the Basque Country, which has long been reputed for shipbuilding and heavy manufacturing. Actually, a broad set spectrum of factories from small family industries to large steel producers is concentrated here and with an annual production of 6 million tons manifests one of the highest steel production densities in Europe.*

*The chosen subject: "microalloying in steels" is of great importance to local steel industries with which Prof. J.J. Urcola Galarza felt engaged to collaborate until his untimely death. The team of people working in close collaboration with him, on steel research, participating in the same inquietude, decided to organise an international symposium on microalloying, following his initial idea. It has been the aim of the organising committee to dedicate this Symposium and the actual proceedings to his memory.*

*The technology of microalloying is now, at the end of the 20th century, widely accepted due to the attractive balance of properties achievable with the correct control of the interaction between steel chemistry and processing. Microalloying is applied to a broad spectrum of products and has two main goals: improve the mechanical properties and save-costs. To cover new development and new trends, invited speakers are presenting papers on thermomechanical treatments, phase transformation, modelling, mechanical properties and alloy design.*

*The editors acknowledge gratefully the assistance and support provided by the organisations and governmental agencies listed as sponsors. Particular thanks are due to the advice and dedication of the members of the International Committee and very specially to Prof. C.M. Sellars for his enthusiastic encouragement when the event was no more than a simple project. Sincere thanks are also due to the invited speakers and authors of contributed papers.*

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## FOREWORD

### The Professor J. Javier Urcola Symposium

The "Microalloying in Steels: New Trends for the 21st Century" International Symposium was conceived primarily as a vehicle to mark the career of Professor J. Javier Urcola, who died in a tragic accident in the summer of 1996. Tributes have already been made for Javier Urcola's distinguished service to the University of Navarra and to education - particularly for his contribution to the teaching of Material Science and engineering in Basque - and for his earnest dedication to the advancement of scientific and technical *euskera,* the ancient language of his home Country; to that end he published two excellent text books and numerous enlightening and educational articles on physical metallurgy and related topics.

Javier Urcola had a deep understanding of metallurgy, which he was able to impart to those who had the privilege of being his students. He provided them with wise guidance and unreserved friendship, and here lies perhaps the key to his success in setting up what is known as his "Virtual School of Metallurgy", so active in his home Country and overseas, particularly in Chile, Colombia and Argentina where so many of his former Ph.D. students are now successful practitioners in the metallurgical trade.

He was endowed with a rich personality. He possessed an uncommon intuition and a special ability to grasp the essence of an engineering problem, two features that were matched with an unusual sagacity to deliver practical solutions. He had a unique ability of observation for natural phenomena, supported by a rigorous academic training. Also, he was a passionate researcher. With all these ingredients, the outcome of his work could be nothing short of the very highest standard of research, carried out in collaboration with an enthusiastic team consisting of past and present Ph.D. students: Isabel Gutiérrez, Jose Maria Rodríguez Ibabe and Beatriz López are among the former. Working with Javier Urcola was great fun. He was frank, warm and extremely easy to get along with. He had a contagious vitality which extended to those that worked with him, and beyond. It is, perhaps, a tribute in itself, that his younger colleagues were able to take up the mantle and maintain a Research Group, of which they, themselves, and CEIT can be justifiably proud.

Javier Urcola pursued research in a wide range of topics. He started off his research, at the Faculty of Engineering of the University of Navarra on its campus at Donostia/San Sebastian (where later on, in 1991, was appointed Full Professor of Metallurgy), working on diffraction of induced substructures in F.C.C. single crystals, followed by a doctoral degree in engineering (Dr. Ing.) He took up thereafter investigations into the solid phase transformations of Fe-based alloys. Later, he moved on to Sheffield where, under the guidance of Mike Sellars, he carried out a very fine piece of work on strain rate transients during high temperature deformation of ferritic stainless steels, Aluminium and Al/Mg alloys and obtained a Ph.D. in metallurgy.

On returning to CEIT, he simultaneously launched two research lines - one dealing with powder metallurgy and the other with the thermomechanical processing of steels. Throughout this period, up until his tragic death, he enjoyed the confidence of industrialists and fellow researchers in European Universities and R&D institutes, which allowed him to win the financial support of companies - to carry out contract research - and the sponsorship of the European Union Brite, ECSC and CRAFT programs. The encouragement he gave to this

approach - a core concept in a contract research organisation such as CEIT - and the success that followed contributed to his promotion to the position, in 1993, of Head of its Materials Department, a position thoroughly deserved and one he pursued with his usual vigour and intellect. Colleagues and friends will miss the characteristic two-handed manipulations with the rolling up of his tie -in the rare occasions he felt it was justified to put one on- as he listened to a speculative rational of some experimental results or a tale of great mountaineering feats.

However, it is out of respect for Javier Urcola´s reputation as an eminent engineer that his many friends and colleagues are gathered here today, in recognition of his contributions to the advancement of steel processing and, more specifically, to the area of microalloying and its associated thermomechanical processes. As convenors, we are gratified by the delegates response: by so warmly entering into the spirit of the occasion. We take this opportunity to thank both speakers and delegates for their whole-hearted support for the meeting and its prime purpose of honouring the outstanding stature of Javier Urcola both as a human being and as a gifted metallurgist.

No meeting of this nature would be possible without considerable financial sponsorship or without the patronage of significant bodies. Their names are listed overleaf but we would like here to express special thanks to Mike Sellars -champion and mentor of Javier Urcola- for his most helpful assistance in working out the concept of this symposium.

*Prof. Manuel Fuentes*
*General Director of CEIT*

*Donostia/San Sebastián, March 1998*