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Proceedings of the European Workshop

MICROELECTRONICS EDUCATION

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PREFACE

This volume contains the extended abstracts of the invited and contributed papers and posters presented at the "1st European Workshop on Microelectronics Education" (1st EWME), held at the picturesque village of French Alps, Villard-de-Lans, during two days (5 and 6 February 1996).

After two days of intensive work and discussions, all participants, unanimously, considered that the meeting was a large success.

More than 150 University researchers and teachers as well as R-D and industrial engineers coming from 23 countries (Europe, Japan, and Brazil) have shared their experiences.

The National policies and the educational modules of 15 University centers from 10 different countries have been presented. The International Cooperation using the available multimedia has been discussed. Pedagogical problems concerning the teaching of "classical" microelectronics (technology, devices and CAD) as well as those concerning the sensors, microsystems and the advanced materials have been examined. Besides more general pedagogical views relative to the extended use of models, simulation and CAD have been exposed. The success of the workshop is due to the fact that microelectronics is, now, at a turning point :

(i) It is a mature technology : by the year 2000 electronics will be probably in the heart of the largest industry of the world ; in this progress the silicon microelectronics will continue to keep a dominant place covering 99% of the semiconductor market [1].

(ii) It is also clear that the existing technology has to get rid of any empirism and has to connect more with advanced scientific knowledge ; the "scientific fabrication" of the next IC generation is a new and large challenge [2, 3].

(iii) The capital investment for an industrial facility for the fabrication of ULSI IC's is estimated being higher than 10 billions of US dollars. It may happen that the gigantic cost of an IC's fabrication facility will be the real limitation and will slow down the exponential evolution rate of silicon technology [4].

Then the only progress will be possible by the advances in IC's design and the emergence of new circuit architectures.

(iv) At any meeting it is usual, for scientists, to have conversation which drift to the funding crisis and its faithful companion, the job shortage. This is not the case, now, for microelectronics. Indeed, the microelectronics industry being in an expansion phase [5], it is expected that 700 000 skilled employees should be hired over a period of five years and more than one million must be trained during the same period [6].

So, the present turning point in microelectronics is due to the conjunction of the industrial (i), the scientific and technological (ii), the financial (iii) and the educational needs (iv).

How, when and what in microelectronics knowledge has to be transfered to future engineers, or simple employees, by education is an important question which has to be approached by a scientific method.

The teaching activity and the pedagogical methods have to be innovative, highly productive and very efficient.

We hope that the 1st EWME has contributed to "shape" a scientific community which will not only share its experience in teaching but which will, also, initiate new pedagogical ideas and new collective efforts.

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Grenoble, 21 February 1996

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President	***Vice-President***	***Vice-President***

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