an opportunity to improve and strengthen the curriculum while attaching internationally recognized labels (bachelor, master) to specific steps. This was confirmed by talks about the experience at ETH Zurich and Utrecht, as well as confirmation from French Grandes Écoles (Polytechnique, ENS Lyon, Ensimag Grenoble) that their programs are or would soon be Bologna-compliant. Utrecht's Jan Van Leeuwen, whose department completed the process in 2001, insisted that such a significant educational change should be carried out quickly rather than dragged out over several years.

Independent of the Bologna process, and like most other places in the world, European CS departments have recently faced declining student numbers. The field's negative image (especially among women), the burst of the Internet bubble, and the fear of outsourcing have all contributed to this broad decline. A few well-publicized rumors have somehow led many people to believe there is high unemployment in the computing field—while, in fact, recent statistics at ETH show that CS graduates have the second-highest hiring rates of all disciplines.

To a certain extent we are experiencing the downside of the hype phenomenon after being on the upside just a few years ago, but in some cases this borders on the absurd. For example, a recent string of articles in the popular press in Switzerland drew from a handful of unrelated police cases and gravely asked whether the proportion of murderers is higher among computer programmers! Such cases are laughable, but characteristic of a general problem with popular perceptions. Participants expressed the strong desire to work collectively to develop a more upbeat image of the CS field. Contrary to popular opinion, most computer scientists have excellent job prospects in most European countries.

European research policy also presents significant challenges. The Esprit initiative and the various frameworks that have followed it have changed the European landscape for technology research, forcing a transnational shakeup of teams and ideas and introducing many opportunities for university-industry cooperation. But there is also a general feeling of bureaucratic heaviness, with the emphasis on consortium-style endeavors involving many partners from many nations at the detriment of smaller, more focused projects. Another characteristic of the European research scene in several countries is the important role of state research organizations not affiliated with universities; a similar situation exists in the U.S. for the health sciences, but not for the CS field.

The financial context raises interesting problems. With the exception of the U.K., Europeans generally want teaching to be free, save for modest administrative fees. In addition, there are neither major endowments nor a tradition of alumni contributions. The result is that European universities are generally far less wealthy than their U.S. counterparts, although the situation varies widely (Switzerland, for example, is very generous to its two technical universities). While some attempts are under way to increase student fees (for example, in Germany and Switzerland), the costs are unlikely to soon reach the levels common in the U.S. or Australia. Private universities in Europe are not common, which means any ambitious research effort requires funding from the state, either at the national level or increasingly from the European Union.

Certainly the CS picture is not all problems and obstacles. A constant theme at the summit, and the reason for its spirited sessions, was a realization of the opportunities open to CS in Europe. The near-gratuity of universities, along with its negative effect on funding, yields a more democratic access to education, and means that European universities have not turned into the fundraising-obsessed business machines their U.S. counterparts sometimes seem to be. The long cultural and scientific tradition of Europe is also a plus; studying on the same benches as Newton, Cauchy, Gauss, or Einstein is not a bad way to motivate oneself.

In the global competition for excellent Ph.D. students, a major advantage for the universities of some countries—in particular the German-speaking world, Northern Europe, and Switzerland—is the system of "assistants," or paid university employees who partici-