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"It's like we're in the garden of Eden"

Prof. Pratsinis talks about the differences between the European and the American System of higher Education

Alexander Schumann, Randahle

alex@blitz.ethz.ch

In blitz no. 3, «Brokolykum», we had an interview with Prof. Pratsinis. In the course of the conversation, he mentioned how great the European system of higher education is and especially, that ETH Zurich is the best school in the world. Although ETH usually is placed high in most rankings, it seldom tops the list. Therefore, we asked him to elaborate on what he thinks are the differences between the European and the American system and why ETH is the best school there is.

Prof. Pratsinis, you have said that we have a great system here in Europe with universities. In the rankings the United States universities are on top. Where do you see the advantages in the European system?

In Europe education is considered to be one of the qualities of life. In the United States education is viewed as a business. Schools, like MIT or Caltech, are private schools, which means that they have to sustain the business. Even some state schools follow that pattern. For example, for the University of Colorado the state only pays 10% of what the school spends, the other 90% have to come in by contracts. As a result, such schools must

respond to the immediate needs of society, making difficult to plan and most importantly carry on long term and in-depth research. On the other hand, in the United States if you are in a research laboratory of a good university on a weekend, you don't notice that it is not a weekday. Libraries are readily accessible. When you come to ETH on a weekend, you can hardly see any laboratory activity. I am sad to see its fabulous infrastructure so underutilized.

As a graduate student at UCLA I would go for dinner and even a movie and then back to the university. Then all my friends would be there because mainframe computers would be much faster at that time. Also, as a professor in the US I observed the same culture with my students in my lab. When some European students came there for short visit, they thought that I had two shifts of graduate students. There was a different group in the morning until 6 or 7 o'clock in the evening and then another one would come, typically the more senior ones who relish the silence of the hour and didn't want to be bothered with the usual chit-chat of the 9 to 5 jobs. So, in the US the students may not have the superior infrastructure we have here but they seem to have strong drive and ownership so-to-speak of their research. This is a different mentality,



Sotiris E. Pratsinis is Professor of Process Engineering & Materials Science at ETH Zurich. He has a Diploma from Aristotle University of Thessaloniki, Greece and MSc and PhD from UCLA. At ETH Zurich he teaches Mass Transfer, Micro- and Nano-Particle Technology and Introduction to Nanoscale Engineering. His research focuses on particle dynamics and aerosol synthesis of catalysts, gas sensors and biomaterials. He has graduated 40 PhD students, published 400+ refereed articles, filed 20+ patents that are licensed to industry and have contributed to creation of four spinoffs.

a dedication, a feeling of discovery, an attitude that can actually make things happen; a belief that education can transform your life. This is not common in Europe though there are exceptions.

How is this attitude instilled in US? Student responsibilities and salaries start from the MSc. Salaries are small compared to Switzerland (~2 kCHF/mo) but when a PhD student becomes a postdoctoral student that salary almost doubles. When s/he joins the industry, it's another doubling. Also the culture of spinoff creation is much more widespread. So, excelling in research has an immediate impact on the bottom line so-to-speak. There, students know that if they can make something important, they will have an opportunity to start a business or effectively market their skills to one. It is most amazing to go to the Annual Meeting of the American Institute of Chemical Engineers or that of the Materials Research Society (MRS) and see how PhD candidates pitch their skills to perspective industry and university employers. In fact at MRS senior scientists like myself are scheduled to advise such students how to effectively interview and prepare their CVs. Here it's a much more uniform society. Most people don't come to university to go through such a dramatic transformation in lifestyle. And although we do high-quality work in Europe, even better than the United States, we don't quickly translate it into products.

And that's probably why we don't do yet exceptionally well to top these rankings which personally I do not believe that much. To me, ETH ought to be way, way up there given the support it receives from the state. In fact every ETH laboratory ought to be at the top of their field given that support. If I would dare to quantify it, perhaps only 30 - 40 % of the ETH potential is used, on the average, while for Harvard, MIT or to Berkeley might be closer to 80 - 90 %. For example, hardly any quality research can be done 9 am to 5 pm. Too many disruptions. So quality work can be done after-hours and on weekends when one can really focus. Here, if someone works on the weekend, people think «Oh he's not that smart». This is what I hear from students when I discuss it. You cannot force that attitude that's unhealthy. The key is to awaken that joy, pride and most importantly «ownership» in a researcher. I'm about to retire and can't wait to come to ETH. To me, it's a dream place, the best on earth. Unfortunately, you guys don't realize that you are truly at the best school on earth. You don't appreciate it. From a scale of 1 to 10, ETH is number 10 for its superior people, infrastructure and «borderless» research laboratories. The second school to come after ETH is either Caltech or Stanford, but they are not better than 8. MIT, Berkeley are at 7 in my scale. It's unbelievable actually, what you have here now, and you will only discover it once you leave.



Production of nanoparticles with flame spray pyrolysis.

Some students, they go to MIT and other US schools to do their thesis, and they see how much stress it is and how the students compete with each other there. But here it's like we're in the garden of Eden and we have not died yet. I mean, it's unbelievable, how great ETH actually is and how little its students take advantage of it!

You truly make most of your schooling at ETH when you participate in the activities of its laboratories. For me it is a joy when I see the teamwork of BSc, MSc and PhD students with the best infrastructure in the world. The sooner you get into the labs of ETH, the better off you are. I have you in my class where you only see 3% of the beauty of ETH, 5% at most. By the way, such a class is not that different than most schools out there from US to Europe, Japan or Australia where I lectured routinely. The 95-97 % is outside the classroom. For example, in my lab, we have these units

that produce nanoparticles at over a kilo per hour. Unique in the world. No other academic institution has that, you only find it in industry.

There are several ETH laboratories that are number one in the world in their fields, but you never see that. From my classroom, does it look like that? Nah. According to your teaching evaluations, as a lecturer I am more or less like anybody else you have. But as I have said: I can't wait until I retire, to go and take classes at ETH from some of its professors. I have a list of, at least, 20 professors where I say these are people that should receive a Nobel prize. And you guys, you can just walk in their lectures— *for free!* In your department, in MAVT, there is probably the highest concentration of such unique people. Raffaello D'Andrea, Frazzoli, now coming back, president Guzzella, Brad Nelson, *Brad Nelson!* He has four ERC (European Research Council) grants in his laboratory when every European professor dreams to get one! The ERC is one of these big grants for research, I don't know if you have heard of it. It's a grant that gives a professor half a million Euros every year to do practically whatever he or she dreams. And professor Nelson has received four! Not just by himself, also with his associate Dr. Salvador Pané. This does not exist at any other university in Europe, to the best of my knowledge. The excellence is just next to you, but you probably don't recognize it. For you it makes no difference whether you go to Nelson or Pratsinis. A mistake! You should go to Nelson also. He's going to be the new head of the department, for the second time, if all on schedule. So, you'll have some rare leadership in the next couple of years. The other guy, Raffaello D'Andrea sold his company for millions, you know that, right? Frazzoli the same. Tell me, which other department has that level of excellence in their professors in that aspect alone? And you tell me now, not to go and take a class from these guys? I can't wait to have the time.

And I can keep going on for other MAVT professors like Hierold, Norris, Poulikakos,

Kochmann, Mohr, you name it. If you go to your sister department for electrical engineering [ITET]: Vanessa Wood, unbelievable, unbelievable! János Vörös, John Lygeros etc.. They are amazing people. You find an excuse to go take classes from them. If you had the chance take some classes in D-MATL from Stoddard and Vermant who also plan to offer a special class to MAVT. Also could you take a class from D-CHAB's Ruth Signorell, Chen, Stark, Ramirez and Grass or D-HEST's Mezzenga and Windhab? Of course, in the bachelor it's not so easy, but in your master, try to listen to some lectures from these people before you walk out of ETH. For example, as a PhD student at I still recall Richard Feynman's answers to pointed questions at his lectures at UCLA. And you don't necessarily learn only what these great professors teach. For me, it is *how* they teach, how they organize their class, how their assistants sup-



So no particles can escape, the lab is always kept under negative pressure.

port them, how they handle questions, how much they care!! The how is as important, if not more, to what they teach. And if you learn that tomorrow you will be in the same position, you have no option. As you grow up, you will be leaders. So you see and you learn from these great leaders. With such input, surely you will not fall behind that far in life.

Werbung



super computing systems



Weltenretter?

Zugegeben die Welt konnten wir bis dato nicht retten, wohl aber verbessern und zwar im Bereich unseres Fachwissens, der Computertechnologie. Hier sind wir zuhause und verändern dank innovativem Querdenken festgefahrene Strukturen, loten das Spektrum der Möglichkeiten aus und mischen Innovation

und Technologie zu neuen marktfähigen Produkten.

Wenn du Innovation als Herausforderung und Leidenschaft definierst, dann bieten wir dir bei uns im Team tolle Einstiegs-möglichkeiten. Willkommen in der Welt des innovativen Querdenkens und der professionellen Umsetzung.

Vision trifft Realität

Supercomputing Systems AG • Technoparkstr. 1 • 8005 Zürich
hrm@scs.ch • Telefon 043 456 16 60 • www.scs.ch



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