Question and Answer: Pierre Wiltzius

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UCSB's Dean of Science talks with us about what brought him (back) to Santa Barbara and what he sees in the future for the sciences here.

Pierre Wiltzius has been UC Santa Barbara's Dean of Mathematical, Life, and Physical Sciences (MLPS), holding the Susan and Bruce Worster Chair for the Dean of Science, since October of last year. He came to UCSB from the Beckman Institute for Advanced Science and Technology at the University of Illinois, Urbana-Champaign, where he had been the director since 2001; there he also held faculty appointments in the Departments of Physics and of Materials Science and Engineering. From 1984 to 2001, he was at Bell Laboratories, where his last position was director of semiconductor physics research. He holds a Ph.D. in physics from E.T.H. Zurich, and spent two years here at UC Santa Barbara as a postdoctoral research fellow in physics, from 1982 to 1984.

In addition to having received widespread praise for his leadership of the Beckman Institute, Dean Wiltzius is a highly regarded researcher and pioneer in the areas of soft-condensed matter, colloidal self-assembly, photonic crystals, and micro photonics. He is a Fellow of the American Physical Society and of the American Association for the Advancement of Science, and a Senior
How did you find yourself at UCSB in 1982?

When I received my Ph.D. in physics from the E.T.H. (Swiss Federal Institute of Technology) in Zurich in 1981, I knew I wanted to come to the U.S. to do a postdoctoral fellowship—that was where the action was in physics. There were several postdoc positions in soft condensed matter—my area of specialization. Ultimately, however, the chance to work with David Cannell, one of the foremost scientists in the field, combined with the beauty of the UC Santa Barbara campus and the surrounding area, were irresistible.

I began the two-year appointment thinking I’d do my postdoc and return to an academic appointment in Europe, to begin the climb up the predictable and somewhat rigid academic ladder there.

Twenty-five years later, you’re back. Tell us about the intervening years?

I never did go back to Europe to work—I was recruited at the end of my postdoc by Bell Labs, which was quite a compliment. Bell Labs had been where some of the most advanced scientific and technological work in the world was done. I was there for 16 years, eventually becoming first a department head and then a division director. Some of those years were great—the ’96 to ’01 dot com era, for example—and sometimes things were not as much fun, as when the dot com bubble burst in 2001.

I’d been thinking about getting back into academia, and the director’s job at the Beckman Institute was a very natural, ‘soft’ re-entry into that world. It’s purely a research institute, with no undergraduate component, which made the transition from Bell Labs easier? Things were going great at Beckman?and then I got the phone call from the UCSB search committee. I’d been following the campus for twenty five years, since my postdoc here, and watched it grow in both size and stature. The campus made some key hires—Alan Heeger, Fred Wudl, and Jim Langer—while I was here in 1982, which sort of set the track in terms of UCSB’s continuing ascendancy in the sciences.

Our biggest opportunity for the sciences and engineering together is, I think, to take advantage of the interdisciplinarity that’s in UCSB’s DNA?its value, and the uniqueness of
Its strength here, can't be overemphasized. Today's societal problems are extremely large and complex, and they require integrated, systems solutions rather than point solutions. We're ideally set up to take on those problems, with our strong departments as a foundation and our interdisciplinary research centers and institutes engendering the integration of our strengths.

What factors were most influential in your deciding to accept the position as our Dean of Science when it was offered?

When the search committee's call came, I realized I'd been missing involvement with undergraduate education, which is, after all, a pretty big piece of the university environment. UCSB is very strong in science and engineering research and undergraduate education, and there's a 'Santa Barbara spirit' that's in the campus DNA. 'Interdisciplinarity' is a term used as a totem and overhyped at many institutions, but it was the basis for the Beckman Institute, and it pervades research here?I think it's fostered, in part, by the campus's simplicity of structure, with no large professional schools complicating relationships and priorities. My own research has always had an interdisciplinary basis, so UCSB is a very good fit, as was Beckman.

The physical compactness of the campus also contributes to the interdisciplinarity here. It's a five-minute walk to get to any collaborator on the campus. Of the other 62 members of the American Association of Universities?the top research universities in the country?only Caltech and Princeton enjoy the same combination of a structure uncomplicated by professional schools and the physical compactness that we have here.

What are the biggest differences in your responsibilities here and at the Beckman Institute?

At Beckman, I had about 170 faculty members, of which 120 had a physical presence at the institute and 50 were affiliated. Each of them also had a primary home department. I had some influence in the hiring process for the Beckman faculty at UIUC, but no decision authority.

Here, I have about 290 faculty members in our ten departments and 4 interdepartmental
programs, and as dean, one of my primary responsibilities is to direct and manage the hiring and retention of the very best people. Much of that responsibility at UIUC was in the hands of the department heads.

**How do you attract and then retain a top-notch faculty?**

You have to start with a great intellectual environment, which we clearly have here at UCSB. Our world-class faculty in engineering and the sciences, and the free flow of ideas here between disciplines, result in a very fertile and stimulating climate—one that promotes the scholarship and research which earns us a place in the upper ranks of major universities.

You also have to have a sound and first-class infrastructure, so that the faculty can concentrate on their work without being distracted by logistics or facilities matters or by administrative details? In hard infrastructure—laboratories, offices, and other facilities—I think we're reasonably competitive. We need to keep building if we're going to stay that way. We are a bit on the lean side when it comes to support staff but that's an opportunity for our campus to grow and become right-sized.

The third factor is student quality, both undergraduate and graduate. Ours is generally very good, and we need to continue on the upslope we've been on, perhaps steepening the curve. Some of our departments and programs—physics, geography, and earth and marine sciences, for example—compete very effectively with any school out there, including Berkeley and Stanford. The rest can, and will, get to that point. One of the big issues that needs attention in attracting out-of-state and international graduate students is the large tuition differential.

**Are you challenging departments which may not be as strong as those that enjoy national prominence to move up to that level?**

I'm challenging all of our departments—even the strongest—to improve, to get stronger? We can always improve, and we will. The biggest impact I can have is to provide the resources to facilitate that growth.

**Are there some specific problems that you feel need to be addressed in order for us to keep moving up?**

Well, for one thing, we're not currently getting a geographically diverse student body? That's true across the campus, not just in the sciences, and it has significant budgetary as well as cultural repercussions. Geographic diversity in our student body will help improve our strengths? To be a truly top-tier research university, we have to keep reaching beyond provincialism. In the same vein, we have to reduce the expense of having foreign graduate students? It's very expensive now, which makes recruitment more difficult and creates an economic incentive for our faculty members to accept their graduate students from California first and then from the rest of the US. That limits our access to the huge pool of excellent students from abroad, and results in a less culturally and intellectually diverse graduate corpus. Also the Fundraising, of course, is always a challenge? probably more so for public universities than private. The current economic climate is certainly not helpful, but, as the economy recovers, we have a huge opportunity as the '60s graduates and the baby boomers are coming of age for
philanthropy. That?s a very large cohort that?s had a lot of economic success, and they?re starting to become concerned with giving back, with helping others and leaving a significant legacy.

I think we can also do more to help move our discoveries out of the academy and into commerce. We?re doing a lot of brilliant science here which results in some great discoveries, but those discoveries only benefit society when they?re applied to solving problems and then those solutions are commercialized, making them broadly available. Alan Heeger, Galen Stucky and Kevin Plaxco, to name a few, come to mind as being very effective in this respect?more of our scientists could perhaps follow their examples. Commercialization of our intellectual property both makes our work better known and generates some helpful revenue, both for the university and for the researchers.

**Are you saying that all our science should have ?real world? applications?**

Not at all? That?s more the perspective of the engineers, who by definition solve real-world problems. We can?t get to the applied science and engineering without having the theory and the fundamental science first. In this day and age, however, the traditional definitions and boundaries are largely obsolete?we have scientists engineering solutions to problems, and we have engineers doing fundamental research, and we have a tremendous amount of collaboration between the two.

**What do you see as the biggest opportunities for the sciences at UCSB?**

Our biggest opportunity for the sciences and engineering together is, I think, to take advantage of the interdisciplinarity that?s in UCSB?s DNA?its value, and the uniqueness of its strength here, can?t be overemphasized. Today?s societal problems are extremely large and complex, and they require integrated, systems solutions rather than point solutions. We?re ideally set up to take on those problems, with our strong departments as a foundation and our interdisciplinary research centers and institutes engendering the integration of our strengths.

Our Institutes for Collaborative Biotechnologies and for Energy Efficiency are great examples of what I?m talking about, and I think we?ll see some of our bioengineering, stem cell research, and nanotechnology expertise coming together in something like a ?nanomedicine? center, creating, among other things, nano-fabricated biomarkers for both diagnostics and therapeutics. We also have a number of different areas of expertise in imaging, and I can see those possibly converging?
We can make some real breakthroughs, in part because we’re able to drive our own research rather than having its direction dictated by clinicians. A good example is some of the neuroscience Mike Gazzaniga and Ken Kosik are doing—their breakthrough work is proof that their field doesn’t have to be driven by pathology, as it is so often when there’s a medical school involved.

Going beyond what’s become almost a traditional collaboration between the sciences and engineering here, I see a huge opportunity in incorporating the social and political sciences into some of our interdisciplinary centers. We’re beginning to see that already, with the Institute for Energy Efficiency’s policy and economics solutions group working alongside the solid-state lighting and computing and communications groups. The Media Arts and Technology program is another example—they’re bridging the arts, the sciences, and engineering. We’ll be seeing more and more of this synergistic interdisciplinarity here, and that’s going to be a big factor in our moving farther up in the rarified world of top-tier research universities. An Institute for the Environment or an Institute of the Science and the Mind are additional examples of potential future focuses.

Is that going to be a sea change in higher education, or at least in research universities?

It’s not going to be?? It’s already happening. Some of the long established, large, well-known schools can get bogged down in 150 or 300+ years of academic tradition, complicated by the interests and influence of their professional schools, making this sort of change more challenging for them—we’re both relatively young and of a manageable size and structure, so we can be nimble and agile and choose the most effective ways to organize ourselves, with relative freedom?

Higher education in general, and our campus in particular, are also going to be seeing a big wave of retirements in the next ten years?some departments here may have as much as 50% of their tenured faculty turning over. That’s both a challenge and an opportunity. It will be tough to fill all those positions with the people we want, but it’s a real chance to renew our vision and to incorporate some new competencies? The no silos? interdisciplinary centers and institutes need a different sort of leadership than the traditional single-discipline academic departments, and those centers and institutes represent our future.

Is there anything you’d like to say in closing?

This is an exciting time to be at UCSB, as the sciences and engineering here are clearly moving up—from an already very high level—in research, innovation, teaching, and reputation. I’m delighted to be part of that growth, and to be in a position to foster it.

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