Meeting Two Remarkable Individuals from California Institute of Technology (CalTech)

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"Caltech is small, but it does not think small!" President Jean-Lou Chameau of Caltech

In the Global research universities landscape, especially in science and technology, two (private) universities in the United States stand "head and shoulder" above all others. One is massive, known as Massachusetts Institute of Technology (commonly known as MIT.) The other is minute, known as California Institute of Technology (commonly known as Caltech.)

Name of Institution	Number of Faculty	Number of Undergraduates	Number of Graduate students	Endowment (in U.S. dollars)
MIT	1018	4384	6510	$10 Billion
Caltech	294	978	1253	$1.55 Billion

The difference between MIT and Caltech, in human and financial resources cannot be more startling. If one were to go by the conventional wisdom prevailing in Asia Pacific, one would automatically assume that MIT would be far "better" than Caltech. However, even the most cursory examination of any university ranking system as given below would tell you otherwise. It is particularly amazing that according to Times Higher Education ranking, Caltech is the best in the world although personally I do not think there is any real quantitative difference between 1 and 10 in any ranking.

Name of Institution	US News and World Report	SJTU Ranking	Times Higher Education Ranking
MIT	5	4	7
Caltech	5	6	1

So why is Caltech so good? I think the answer is simple and wrapped up in two words: ITS PEOPLE!

With this as background, it was especially interesting for me that during the late January and early February 2012 visit of University System of Taiwan to California, our delegation was fortunate to meet two distinguished individuals from Caltech. From our interactions with them, it gave us a glimpse as to why Caltech being small can still be supreme in quality.

One of the individuals is **Professor Jean-Lou Chameau**, 59, currently President of Caltech.

The other is **Professor Theodore Y. Wu**, 89, (吳耀祖,) Professor of Engineering Science emeritus.

We met President Chameau in his office at Caltech and Professor Wu at a dinner sponsored by Taipei Economic and Cultural Office (TECO) in Los Angeles. As one of the two photos shows, I was simply supremely lucky to be sitting next to Professor Wu at dinner.

President Chameau is second from the right

Professor Theodore Y. Wu is the gentleman in the front

According to wiki, http://en.wikipedia.org/wiki/Jean-Lou_Chameau

Jean-Lou Chameau *(born 1953) is a civil engineer and the current president of the Caltech. Previously he served as a provost of the Georgia Institute of Technology. Chameau received his secondary, undergraduate, and graduate education in France where he attended the Arts et Métiers PARISTECH (ex ENSAM). He then obtained his Ph.D. in civil engineering from Stanford University. In 1980 he joined Purdue University, where he became full professor in civil engineering and head of the geotechnical engineering program. In 1991, he was nominated director of the School of Civil and Environmental Engineering at Georgia Tech.*

Chameau became president of Caltech on 1 September 2006, succeeding David Baltimore who served nearly nine years in the post.

In 2010, he received the Chevalier de la Légion d'honneur award.

I should add that I have been an admirer of growth of Georgia Tech intellectual prowess ever since I was a Vice President for Research at the University of Texas at Dallas. For this reason, I made it a point to follw the careers with great interest many of the senior administrators of that university for quite some time, and President Chameau was one of them. In fact, I was not in the least surprised that Caltech would select him to replace the legendary David Baltimore. For this reason, I am especially pleased to meet him face to face in his office in Caltech.

According to wiki, http://en.wikipedia.org/wiki/Theodore_Y._Wu

Theodore Yaotsu Wu *(born 1924) is a Professor Emeritus of Engineering Science at the California Institute of Technology. His research contribution includes compressible fluid flow, free-streamline theory of cavities, jets and wakes, water waves and free-surface flows, mechanics of fish swimming and bird/insect flight, wind and ocean-current energy, and internal waves in the ocean.*

Wu was born in an educated family. His father had a degree in economics and finance, his mother graduated from high school and majored in literature, while his grandfather was a Chinese physician.

During the Japanese invasion, the Japanese airplanes flying overhead eventually inspired him to enter aeronautics in the university.

Wu received his BSc from Chiao Tung University (1946), and spent one year teaching upon graduation. In January 1948 he arrived in the U.S. and enrolled at Iowa State University and graduated with an MS in December the same year. After Iowa, Wu came to Caltech, where he shared an office with Julian Cole. Wu was involved in the research group headed by Paco Lagerstrom, where they developed further the asymptotic perturbation method pioneered by Ludwig Prandtl.

Wu received his PhD in (1952), subsequently worked as a research fellow at Caltech for three years, and developed interest in water waves and hydrodynamics, due to the stimulus given by Qian Xuesen (錢學森) and von Karman. After three years Wu became an assistant professor of applied mechanics (1955) at Caltech. In 1960, under the influence of G. I. Taylor and James Lighthill. Wu started to work on fish locomotion and bird flight (biofluiddynamics). During his time at Caltech he has also contributed to the field of naval architecture and been involved in the International Towing Tank Conferences.

Wu retired in 1996, but is still very active after his retirement.

I should add that among all the Chinese in the world, he is one of the few who has the "Tri-"academician title: US National Academy of Engineering, ROC's Academia Sinica and foreign member of Chinese Academy of Sciences. In fact, I have known the enormous reputation of "Ted Wu" for many decades, but did not know his Chinese name. Therefore, it took me awhile sitting next to him that Yao-Tsu Wu (吳耀祖) is the same Ted Wu I have admired for a long time.

So what combined lessons could we learn from meeting these two individuals?

First, they both speak English with "noticeable native accents": French in Chameau's case and Chinese (with a touch of Shanghainese!) in Wu's case. This tells me that when Caltech seeks individuals to serve either as administrator or faculty, they simply look for the best, independent of race, creed and nationality. Quality is NOT a negotiable item. Once an individual is selected, he/she will be immersed in the Caltech culture, and will become a "Caltech-er!" Although this is so transparent, it is indeed a lesson Asia should learn in the 21st century as it tries to also improve its higher education standing in the world.

Second, in Wu's case, his entire career was immersed in Caltech. There is no question that with giants such as von Karman and Qian Xuesen (who became China's Father of Rockets (中國火箭之父) not by his choice,) the intellectual landscape of hydrodynamics of Caltech was built on firm and deep underpinning. Thus, standing on this foundation, Wu possessing enormous inherent intelligence could only flourish and became a *maestro* in his own right. The lesson here is that intellectual depth takes time and multiple generations to develop. Patience is essential. I suspect in this respect, Wu is typical and not atypical in Caltech.

Third, discussion with President Chameau, albeit brief, was very pointing. We quickly drifted into how such a "tiny" school such as Caltech could manage gigantic projects, such as running administratively and probably intellectually a national operation known as **Jet Propulsion Laboratory**. In this regard, the most memorable words uttered by President Chameau, in response to our question, was "**Caltech is small, but it does not think small!**" It was especially eye-opening for us to learn from President Chameau that Caltech makes every effort to "remain small!" On reflection, it is a normal human impulse to "expand." Keeping something small is contrary to how human organizations operate. In Caltech's case, to remain small in "size" and maintaining supremely high quality but to think "big"

seems to serve it well. I believe that utilizing Caltech as a case study for higher education development in Asia Pacific in 21st century is certainly worthwhile.