Interview with Dr. Zheng, Founder of Planck Energies, by BARTV (Boston Asian Radio & TV Station)

Dr. Zheng had an in-depth interview with BARTV in his lab, discussed about variety of topics includes his research, career path, and his prospective about STEM.

BOSTON, MA, USA, January 12, 2023 /EINPresswire.com/ -- Dr. Zheng, the founder / CEO of Planck Energies, invited the team of BARTV to visit his laboratory in Northern Eastern University, and had an in-depth interview on his study of nano energy, career path in STEM majors, and lots of his own prospective to the industry, to STEM students, etc. Hope this will influence more people.

1. For laypeople, how to introduce your research field and research results in plain language?

My research falls in the area of clean tech and functional materials for energy applications. We investigate both nanoscale and life waste materials (for example, cow manure, tree leaves and lobster shells) for solar energy harvesting through PV cells, solar driven water desalination, and passive cooling to reduce carbon footprint for air conditioning for infrastructures and vehicles.

2. For the current research topic, from theoretical research to large-scale application, do you have any timeline in mind?

Not all my research is theoretical. Some of them are quite fundamental and will not be converted into application within a short period of time. Regarding the passive radiative cooling

project, for which I have studied for years and invented a few high-performance materials, I have a clear timeline in my mind. I also founded a cleantech startup Planck Energies, to commercialize passive cooling products and provide energy-saving solutions. We already spent one year creating innovative self-cleaning, fireproof cooling fibers. And we have been working on the large-scale manufacturing and outdoor durability test for months. We expect to have our first prototype products ready in 6-8 months. But in general, it could take a long time to transform lab-scale research to pilot-scale to industry-scale, eventually to benefit the human being (real applications).

3. When science and engineering students choose their research direction, they often struggle between theory and application. What do you think about this problem?

My suggestion is to follow your heart. If you like conducting fundamental research including theory and simulation, just choose it. If you own strong hands-on experience, choose the applied research. No need to struggle. If you were a theoretical person, but you were forced to conduct some experimental tasks, it would be a disaster to both your advisor and yourself. Don't let that happen. If the students have any questions or concerns about their assigned project, please talk to the advisor directly, before something bad happens.

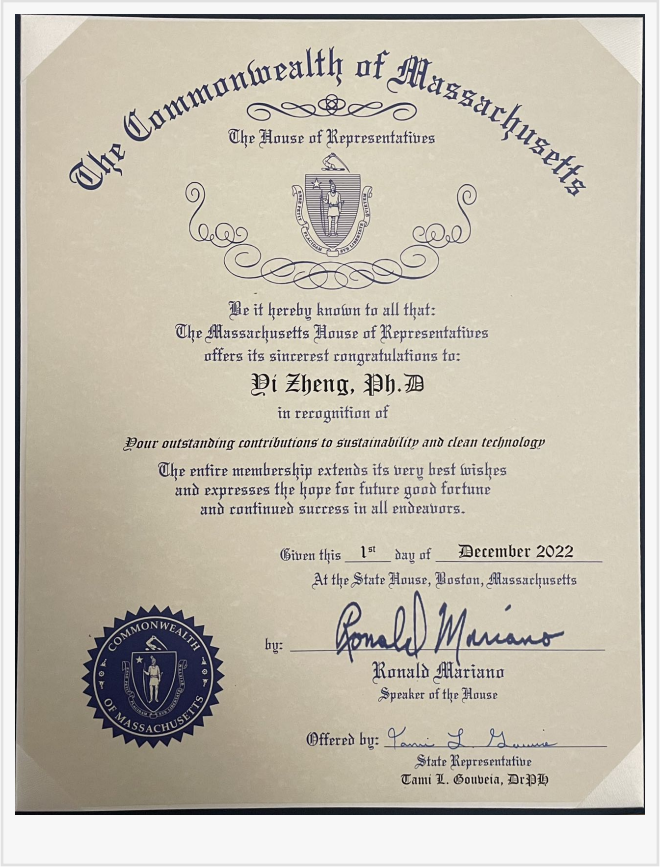
4. In China and may the US as well, many outstanding students are more willing to choose computer and finance related disciplines. Are you worried that there isn't enough talent in nanoscience to go around?

Good question. Frankly speaking I don't worry about this situation at all. I admit some disciplines like computer science and finance are important and popular nowadays, but nanoscience is hot too and it will be hotter. For example, I was a good student long time ago, but I chose nanoscience, because it fits my research interest well. In addition, to address some global concerns about energy and water scarcity, people can always find solutions through nanoscience

and nanoengineering.

5. How did you choose your tutors and students?

As a student pursuing an MS or PhD degree, you need to show and convince your future advisor you are eligible and qualified because of your capabilities and experience. For example, what projects have you participated in or conducted in the past? What kind of skills or software you learned, like programming, modeling, system design, and material characterization. For most cases, as an advisor, I care more about the prospective students' capabilities and enthusiasm in research, but not their GPAs or GRE scores.


The Commonwealth of Massachusetts

The House of Representatives

Be it hereby known to all that:
The Massachusetts House of Representatives
offers its sincerest congratulations to:

Yi Zheng, Ph.D

in recognition of

Your outstanding contributions to sustainability and clean technology

The entire membership extends its very best wishes
and expresses the hope for future good fortune
and continued success in all endeavors.

Given this 1st day of December 2022
At the State House, Boston, Massachusetts

by: Ronald Mariano
Ronald Mariano
Speaker of the House

Offered by: Tami L. Gouveia
State Representative
Tami L. Gouveia, DrPH

6. What prompted you to choose mechanical engineering as the beginning of your academic career? Why did you change to nanoscience as your current field of study?

The reason I chose mechanical engineering might be because of my family. My dad is a civil engineer and when I was a child, I was intrigued by his engineering jobs about drawing graphs and reading tables. At my 10-11th grades, I attended the Science & Technology Innovation Contest in China, was awarded a gold medal, and filed two patents in high school. That led me to study mechanical engineering at Tsinghua University for my undergrad study and Columbia for my PhD study.

Actually there is no conflict between nanoscience and ME, as nanoscience is multidisciplinary. ME has a part in nanoscience, in which my research interest is. Sometimes, classical theories may not hold true or materials may not function well, but nanoengineered materials and theory do.

7. Many Chinese students and researchers are faced with the question of whether to continue their career in the university or industry. What do you think of that?

For myself, I always wanted to become a professor. That was one of my dreams and it came true. I still remembered the first meeting with my PhD advisor, he asked me what my career plan would be, I told him I want to become a professor like you, with no doubt. When one has a dream, go for it. Since I started my PhD study, I spent most of my time conducting research in lab. I never had an intern from any company so far. That might be my weakness, but it makes me.

My suggestion is to do what you are good at, wherever you are. Sometimes the research positions at universities are limited. It is a hard decision, but be noted, you could still continue to do research in industry. Some faculty members do have industrial background and experience, from which they could benefit much.

8. Similarly, they often struggle with whether to stay in the US or returning home. What do you think? (As far as I know, China's photovoltaic industry and many fields of material science are world-leading)

I believe there are lots of discussion about this topic for decades. It is extremely important to make a career decision for anyone, including myself. To stay in the US or back to our home country. It happened to me too. But what I am doing now already answered the question.

Say, two situations here. If you could only find jobs in one place but not the other, take the job. However, if you could have jobs in both places, take the one that makes you and your family happy, proud, and comfortable. Happy (happy wife, happy life); proud (you could make greater accomplishments like Dr. Yan Ning); and comfortable (colleagues, environment, even food).

9. The first step is the hardest. Do you remember how your first paper, your first scientific research results were born?

Of course. My first published work was developing a theory for van der Waals/Casimir force using fluctuational electrodynamics. It sounds complicated, right? It was. I spent much time reading all relevant literatures, and then doing theoretical derivation out of Maxwell's equations by hand and writing my first English paper. That whole process was tough, but I was so excited to get my first paper published in the Physical Review A. Without the supervision of my PhD advisor, I could not achieve it.

10. Bottlenecks in scientific research are often frustrating. Have you had a similar experience? How did you spend it?

Graduate students and their advisors have different bottlenecks. Students may not know how to proceed if the existing approaches all failed. It is indeed frustrating. It is not a bad thing, because it means what you are doing is innovative. First, be calm. Second read more papers which could help you find solutions. If not, discuss with your advisor and get some guidance.

For me, as an advisor, my bottlenecks might be to find the proper research topics for my graduate students. The cool, creative ideas may not show out themselves automatically. It takes time and sometimes it depends on the depth and breadth of my knowledge. I would suggest discussing with your colleagues and peers often. It would help spark new ideas. For example, a well solved problem can be a completely new area if we stand from an interdisciplinary or multidisciplinary point of view.

11. Boston is a college town. Have you considered some kind of intercollegiate collaboration with scholars and ordinary students at other prestigious universities here, or at your Alma maters Columbia or Tsinghua?

Research is innovative and independent, but never an individual work. It needs collaboration inside the lab, and outside. I am collaborating with some research groups in other departments at Northeastern University (the place I am working at) and at other universities like MIT, University at Buffalo, and Brown University.

12. What do you think of the scientific research prospect of combining nanoscience with artificial intelligence?

The combination of nanoscience and AI is an excellent multidisciplinary area. Actually I am working in that area. I have been working with two professors, experts in deep learning and computational algorithm, for a while. One of our research proposals is still under reviewed by the National Science Foundation, about the utilization of AI to the functional metamaterial design.

13. As a Chinese scholar, what do you find convenient or inconvenient about your life and research in the United States?

I was born in China, and now I am a US citizen. Precisely speaking, I am a Chinese American scholar. Our native language is Mandarin Chinese. It has two sides of a coin. It does help us make more friends who speak Chinese and get us exposed to more research reports and papers written in Chinese. However, as our native language is not English, it might be a little struggling to work with the local people as we share different culture. Sometimes, we may not be able to express ourselves quite well. It is frustrating. As an immigrant, to be successful, we need to try our best to keep learning and improving ourselves from all aspects.

14. From Tsinghua University to Columbia University, and now to the Director of Nano Energy Laboratory at Northeastern University, have you ever felt pressure from the prestigious reputation and the title of "young talent"?

Thank you. There are lots of those “young talents” who have similar or better background. People are always impressive by their achievements and accomplishments, but easily neglect the great efforts they made or feel the pains they suffered. I just want to say, be yourself and live and work happily. There is NEVER an end to research, to work. But there is an end to life. Just enjoy.

15. Do you think Chinese scholars have any special advantages or disadvantages?

Thanks for giving me this opportunity to think of our special advantages or drawbacks. As we have different backgrounds in our mindset, culture, education, and way of thinking, we could

benefit much from that. For example, Dr. Tu Youyou, the Chinese Nobel prize laureate in medicine, was inspired by the Chinese traditional medicine and then succeeded. The interesting thing is: Two of our recent works were inspired by the Chinese traditional origami structures or oil-paper umbrella, to solve the global warming and water desalination problems. It is pretty cool. The disadvantage can be obvious. Because of our Chinese background, Chinese American scholars may also be affected by the China Act. What everyone must keep in mind is to comply with the laws all the time. Protect ourselves. Protect our community.

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