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The X factor

Xiaolin Wang, Stud.AIRAH, AIRAH's reigning Research Student of the Year.

The ANU's Xiaolin Wang, Stud.AIRAH, is the reigning winner of the AIRAH Research Student of the Year. She shares her journey from China to the nation's capital.

Eco: When did you first decide you wanted to be an engineer, and how did you get to where you are today?

XW: To be an engineer means lots of hard work. However, I didn't realise this when I decided to study for a Building Environment and Equipment Engineering degree at university. Even though I was uninformed about the profession, I chose to be an engineer just because of my good performances in maths and physics.

Although I finally found it was not as easy as I expected, I had a passion for it, especially when analysing a system and thinking about energy-saving solutions. I found this is the career I wanted for myself.

My hard work was rewarded. I achieved very high academic scores, for which I was recommended for a Master's program at Shanghai Jiao Tong University (SJTU) without needing to sit for the entrance examination.

Later, I ranked third of all international Higher Degree Research scholarship applicants, and was recruited to the Australian National University. I composed 22 research publications and was awarded many scholarships and awards, including the AIRAH Research Student of Year. Most importantly, I developed a reliable, highly efficient and environmentally friendly energy storage material during my PhD program. I am very satisfied with what I have achieved so far.

> "I developed a reliable, highly efficient and environmentally friendly energy storage material"

Eco: How would you characterise your approach to work? What are the fundamentals to your philosophy and process?

XW: I attach most importance to work efficiency. I would normally complete tasks long before the deadline so that I could spare sufficient time to tackle any sudden changes. However, working fast is not always good, since I may sometimes rush and omit things. To overcome it, I conduct regular reviews and check to minimise mistakes.

Eco: Do you have a checklist you always follow at the start of a project?

XW: Definitely research projects require a clear mind. A checklist is always needed, and for the best outcomes a timetable is helpful. Using a timetable enabled me to divide big tasks into small targets to accomplish these within a set period of time. Therefore, projects are no longer huge mountains to cross; instead they are short hills that are easy to tackle.

After finishing my PhD program, I no longer work on projects. I do miss this type of work, and I hope to get a job to continue work that allows me to project into the future.

An experiment set out to prove cold storage is comparable to battery storage in reducing energy costs.

Eco: Are you open to new ideas, or are the old ways the best ways? Do you like to collaborate?

XW: If the old ways were the best we would still be burning wood for heating. To me, the truth is to admit the importance of experience but also be receptive to new ideas. While an undergraduate student in China, I observed problems with incumbent technologies and came up with innovative solutions. I often talked to my supervisor about these ideas and he helped me to make them more workable. As a result, we were able to apply for 13 patents.

I also feel it is important to collaborate. You cannot swim with only one arm moving. In this case you are making a big effort but you are not moving at all. The collaboration of all team members or with other institutes, like the synergy of your body, arms, legs and feet in swimming, can really make the project move forward fast.

Eco: What are your favourite projects you have worked on and why?

XW: At the ANU, I researched a new material based on a cold-storage system. This cold-storage system can serve in existing air conditioning systems, saving energy by alleviating the grid peak load and prompting the use of solar energy.

"Warm Ice" crystals observed in an experimental program.

I started this project from simulation to show that cold storage is comparable to a battery storage in reducing energy costs. I then studied a novel phase-change material, using a chemical method to modify its properties for practical applications. Finally, I could employ the optimised material in a lab-scale cold-storage system integrated to an air conditioner. This is one of my favourite projects because I could investigate from the proof-of-concept right through to the feasibility of commercialisation. This project not only broadened my knowledge but contributed to the advancement of knowledge in energy efficiency.

Eco: Whom do you admire and why? Do you have a mentor? Do you gain any satisfaction from mentoring others?

XW: I have two mentors who have helped me most in my career. One is Dr Mike Dennis, M.AIRAH, my PhD supervisor at the ANU, who is professional, patient and willing to help his students not only to develop research skills but also to adapt to the Australian industry or academic community. The other one is Prof Xiaoqiang Zhai, my Masters supervisor at the SJTU, who trained me in conducting my first research project and encouraged me to write my first research article. Most of my skills and expertise were developed through their help.

I had been mentoring undergraduates because I was a tutor at the ANU and a student counsellor at the SJTU. I had a sense of satisfaction when I found I could use my own experience to help others.

> "I also feel it is important to collaborate. You cannot swim with only one arm moving"

Eco: Are there interesting, funny or quirky facts you could share with us about your work and what you do?

XW: The most interesting thing I've found is that scientific research not only brings you heaps of data, new systems, high efficiency or low carbon emissions, but also brings you sparkles and beauty beyond thought – the crystals of "Warm Ice" we developed in the lab. It not only stores a large amount of thermal energy but also attracts your eyes.

Eco: What advice do you have for emerging engineers who wish to follow in your path?

XW: Be brave enough to speak in front of people, and be willing to share your knowledge and ideas with others.

Eco: What's the most important lesson you've learned throughout your working life?

XW: Collaboration is always an important factor to fulfil expectations.

Eco: What's next for you, and what are your goals for the future?

XW: Continue researching and creating technologies for a better life.

Eco: What does AIRAH membership mean to you?

XW: Scientific ideas are more valuable when they can serve the market's and industry's needs. AIRAH helps me to gain knowledge on the research and development of the Australian HVAC&R industry to align my research orientation. AIRAH has also offered a new vision to me about future prospects, and provides me with opportunities to get to know brilliant people in this industry.

Eco: Describe yourself. What are your defining characteristics?

XW: Active, daring and humble.

Eco: If I wasn't an engineer, I'd be a …

XW: Undoubtedly a costume designer.

Eco: Do you have hobbies or diversions?

XW: Pencil sketching.

Eco: My most valued possession is . . .

XW: My attitude towards life.

Eco: Tell us something about yourself others might not know.

XW: I'm a combination of indecisiveness and impulsivity.

Eco: In five years, I'd like to be . . .

XW: A researcher who can bring innovation to the industry. ▮