International Chem-E-Car Interview

with the AIChE Student Chapters at the Hong Kong University of Science and Technology (HKUST), King Fahd University of Petroleum and Minerals (KFUPM), and Korea Advanced Institute of Science and Technology (KAIST).

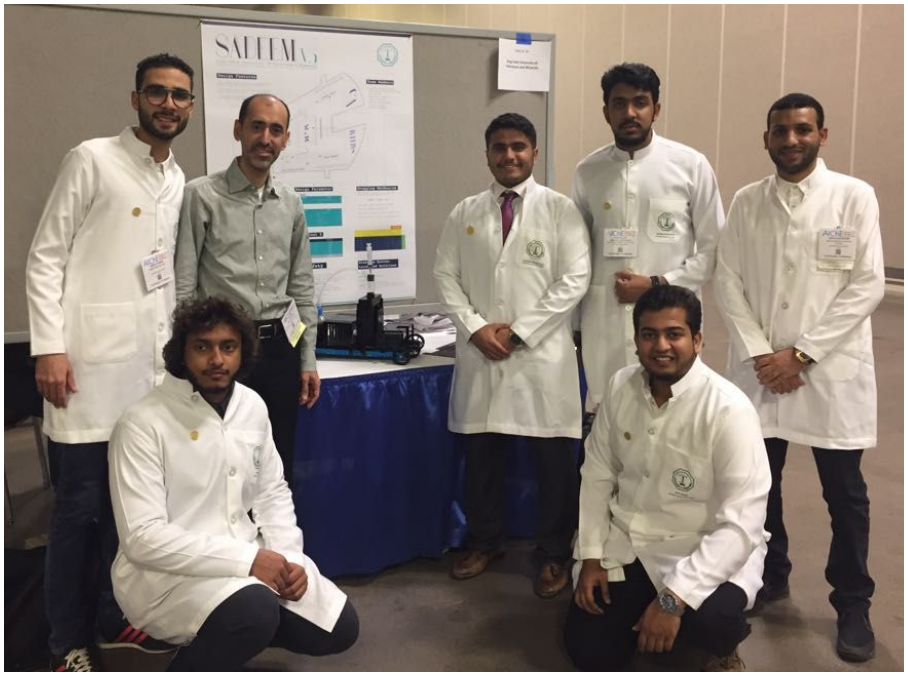
Every year, Chem-E-Car teams from around the world travel to AIChE's Annual Student Conference to compete in the Chem-E-Car Competition®. At the 2017 ASC, teams from the Hong Kong University of Science and Technology in Hong Kong, King Fahd University of Petroleum and Minerals in Saudi Arabia, and Korea Advanced Institute of Science and Technology in South Korea all traveled to compete in Minneapolis, Minnesota, USA. These 3 Student Chapters of AIChE shared their experiences in an interview with the ESC.

1. How did your Chem-E-Car team get started?

KFUPM: The first Chem-E-Car team at KFUPM was started in 2014. A student who was a member of Chem-E-Car team at another university in the US brought the idea of the project first to Dr. Basim Abusaud, who is a faculty professor at KFUPM Chemical Engineering Department. Dr. Abusaud liked the project and made the establishment of the first team possible by fulfilling all requirements and paperwork with KFUPM administration along with Dr. Ba-Shammakh, the chemical engineering department chair.

2. How is your Chem-E-Car team structured?

KFUPM: The team consist of three sub teams: Powering team, stopping mechanism team, and design team. The power team's job is to find a reliable chemical reaction that can produce power or fuel which is further used to power the car. The stopping mechanism team task is to create an accurate stopping method that accounts for the distance range and the variable weight on the vehicle. The design team oversees fitting all power and stopping equipment into a good-looking car and facilitates different functionality requirements inside the body. Each of the three sub teams have a group leader and the entire team has a captain who is also a member of one of the three sub teams. The group captain reports to the chapter advisor and the department chair.



KFUPM's Chem-E-Car team at the 2017 ASC Chem-E-Car Competition®

3. How did you come up with the name for your 2017 Chem-E-Car?

KAIST: Our car's name was "LUMBORGHINI", which is a combination of "Luminous" and "Lamborghini". Luminous is for luminescence, and Lamborghini is for the car.

KFUPM: Sadeem V4 as the name implies is the fourth KFUPM Chem-E-Car. All the previous versions had the same name Sadeem. This is because the naming of the first car was at the time when Dr. Abusaud named his newborn daughter Sadeem. The team members then decided to give the car the same name which was their way to show their appreciation for the efforts Dr. Abusaud paid to make the Chem-E-Car dream possible. Sadeem means space dust in Arabic.

HKUST: The name we went for this year was "Indigo". We came up with this name when we were thinking of how to innovate something new to gain a competitive edge in the competition. So our team leader jokingly said that we need to "innovate on the go" which sounded like "innovation indigo", so we just decided to go with Indigo since it's simple and goes with our motto.

4. How is your Chem-E-Car funded?

KAIST: Overall funding was supported by our department office including airfare, accommodation, and other conference or travel related expenses. Additional expenses were covered by the team members.

HKUST: Our research, car, and trip were all funded by the HKUST Chemical and Biological Engineering department. We would like to express our gratitude towards the department for their immense support and belief towards us to enable us to have such a great experience in participating in the competition.

KFUPM: The team is funded by KFUPM and Chemical Engineering Department.

5. **What did you learn from your experience competing at the Annual Student Conference?**

HKUST: We think the most important thing we learned was to trust each other. We each had a specific role to play amidst the competition, and we each had our own individual expertise or knowledge. During our regional competition in Hong Kong last August, we still seemed to have a lot of doubts going into the competition which led to our team functioning inefficiently. But we gradually realized that we had to work together in order to finish everything on time so we had to focus on doing our own parts well and trusting each other.

KFUPM: Well, a lot! Valuable lessons and information such as sportsmanship, cooperation, hard work, marketing skills, presentation skills, and chemical engineering technology trends and connections.

6. **What would you tell an AIChE Chapter that is interested in competing in Chem-E-Car?**

KAIST: We had great results at the competition, but preparing for the ASC Chem-E-Car Competition® was not that easy. There are a lot of experimental failures, unbearable loads press our team even in the period of academic exam, and the vacation also blew away with preparing it. However, being able to represent our school, KAIST, motivated us. If you have an opportunity, please “don’t hesitate to do it!”.

HKUST: Go for it. This competition is an intriguing application of various disciplines including chemistry, electronics, mechanics, programming, etc. It is such a fun and exciting experience to be able to compete with chemical engineers from other universities and being able to see their passion for the competition as well.

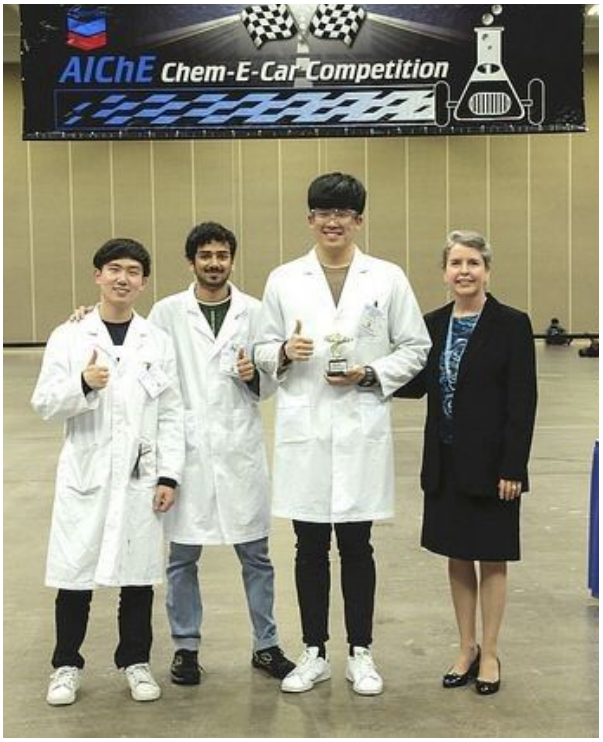
KFUPM: Building a Chem-E-Car is a very exciting and creative task. However, to start a Chem-E-Car project, chapters must have a place (laboratory) and funds. Having a lab and money or chemicals and tools is the first building brick of a Chem-E-Car project and when a chapter possesses these two requirements they are ready to form a team and start building their vehicles. The Chem-E-Car Competition® is a great opportunity for undergraduate students to spend their free time on something fun, challenging, creative, and productive.

7. What advice do you have for other Chem-E-Car teams?

HKUST: Although a lot of the cars that competed in the competition used sophisticated car designs, mechanisms, and reactions, I think that the best way for a new team to get started is to go back to the basics and then gradually improve specific parts of the car. We started with a toy car kit from Taobao to have a functional car to test on and learn the basics, then we gradually built our car from scratch through laser cutting, 3D printing, etc.

KFUPM: The greatest advice we can think of is having a homogeneous team. The chemistry between the team members is a critical factor that directly affects the productivity of the team. From experience, KFUPM's team with the best performance in the international competition is the team with the best chemistry among its members.

KAIST: Performing plenty of experiments, checking your accuracy, and compiling the data is really important. To get proper data, it might be important to design "elaborately" when you start to do the first experiment. Collect sufficient information on doing it, and design it elaborately!



KAIST's Chem-E-Car team at the 2017 ASC Chem-E-Car Competition®

You can read more about the 2017 ASC Chem-E-Car Competition® in its ChEnected recap.

The ESC wishes to thank the AIChE Student Chapters at HKUST, KFUPM, and KAIST for their participation in this interview.