The new academic year is underway and with it a cohort of 75 eager 1st Professional year students are entering the Department and another approximately 840+ Intermediate students joining the School of Engineering. The Department is looking forward to a year of change with the Department's new building giving us back our lost space. The new CAPE lab will give us the facilities to be at the forefront of process engineering education. We are lucky to have great relationships with alumni and industry that is improving the educational experience.

The Department has also celebrated the recent success of some of our academics who continue to innovate: Dr. Simone Dimartino, Prof. Conan Fee and Dr. Daniel Holland have received research funding in the 2015 Government funding rounds. Information about these interesting projects can be found below.

**New Building:**

The new building is advancing quickly. The roof is now in place and the cladding of the outer walls is underway. You can see the progress for yourselves in Figures 1a and 1b. The new space is due to be finished mid-year and available to occupy in the second half of the year. Staff were able to tour the new building at the end of 2015 and were impressed with the areas. This project has had input from a variety of sources including substantial effort from department staff ensuring the space is fit-for-purpose now and for the future.


**Figures 1) a)** View of the new Chemical and Process Engineering building looking west towards the Engineering Quad. The entrance to the basement of the former Siemon building can be seen on the right. **b)** Looking east from the Civil/Mech building including the revamp of the Engineering Quad in the foreground (including a new roof).

Please continue to follow the progress yourselves with the links to the webcams imbedded in the pictures (1a and 1b).

**CAPE Laboratory Development:**

In our last issue we introduced our CAPE Lab Development. The goal is fit-out the new building with modern teaching apparatus that strengthen the relationship between labs and process design. This project continues to advance with our first new experiments having arrived and are currently being commissioned. Two glass 2 L reactors will be used for demonstrating and

investigating batch reactions, introducing some practical understanding of scale-up and some of the limitations incurred in the chemistry. The size of the systems means that they can be transported for demonstrations in lectures and plans are being developed for teaching the mathematical perspective of mass balances as well as reaction engineering.

The next experiment we are proposing requires new heat exchange equipment. During 2015, the class of 1965 had a 50-year reunion at Canterbury and to commemorate that great milestone they decided to get together and purchase a heat exchanger for use in the teaching labs. We are working with them to design the heat exchanger and refine the experiment. The reunion event coincided with the 2015 April graduation and was a great success. The class of 1955 celebrated their 60-year reunion at the same time. These two events combined with graduation gave the alumni a chance to meet staff, the recent graduates and their families. The students enjoyed the opportunity to hear about the diverse process engineering careers possible. The Department enjoyed the opportunity to catch up with alumni and would happily help facilitate more reunions or get-togethers so please don't hesitate to contact us if you are want to be in touch with other alumni.

One of the most exciting aspects of the development is revitalizing our large distillation column. The column has had a long history in the Department, originally used for research; we are now repurposing this equipment for teaching. The goal is to have a functioning methanol/ethanol distillation system and working control room for use by the students. To do this we have been working with leading instrumentation and control supplier Emerson Process Management. They have been an active supporter of the Department over the years. Together we are exploring ways to use Emerson control systems on the column and elsewhere within our new facilities to expose the students to state of the art controls and monitoring interface.


**Figure 2**: The 9" distillation column will give the students an authentic industrial experience and some hands on experience with larger equipment

Support for the project is also coming from a bequest given to the Department. The bequest from John Sutherland has, in the past, enabled the Department to host some prestigious guests and support some top postgraduate students. It has been a great resource for supporting the Department's research capability. We now have the opportunity to use some of this money for our undergraduate students and we will do that through the CAPE lab development; a fantastic use of the money and a tribute to our alumnus.

These are examples of how the Department is achieving something that would not be possible without direct alumni support. We cannot achieve such an ambitious task without your collective

support. We would welcome your, your company's and graduating class's involvement. No donation is too small. Similar to New Zealand's support for the Awaroa beach purchase, alumni support to the undergraduate experience can dramatically improve their learning environment. For more information, please contact Garrick Thorn at garrick.thorn@canterbury.ac.nz. Or give directly via Alumni and Fundraising.

**Research Success**

***3D printed adsorptive media***

Prof. Conan Fee, Dr. Simone Dimartino and staff from Mechanical Engineering have demonstrated that they can use 3D printing methods to create perfectly ordered structures. Its intended these materials will be used for separations and biomedical applications. Following the success of a government funded Smart Ideas Phase One project, they have secured Phase Two funding continuing the path to commercialisation, improving resolution and exploring novel materials for the project. The research is expected to have a wide range of important applications including: bioseparations, pharmaceuticals, catalysis and filtration, as well as in tissue scaffolding for regenerative medicine. Simone has recently taken an academic position at the University of Edinburgh but will continue to collaborate on the project making this an international joint development. It is also great to see Simone move from a fixed-term position to a continuing position at such a prestigious university. It partially reflects his hard work and success at Canterbury. We wish him all the best in the future.

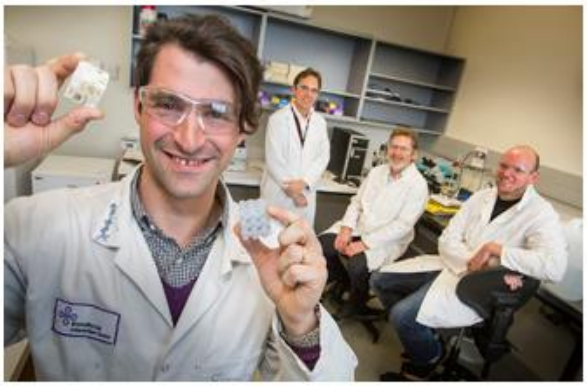

**Figure 3**: Foreground: Simone Dimartino, (left to right) Don Clucas, Conan Fee and Tim Huber are working on the successful project 3D printed adsorptive media, which will receive funding from MBIE.

***Quantitative Benchtop NMR using Bayesian Analysis,***

Nuclear Magnetic Resonance (NMR) is one of the most widely used analytical techniques in chemistry. However, traditionally in order to get the sensitivity, superconducting magnets that cost upwards of $1 million are required. Dr. Daniel Holland's newly funded project will develop a new mathematical approach for the data analysis that will make cheap, portable, instruments as sensitive as current superconducting instruments. This approach will enable NMR to become a standard analytical technique, as common as mass spectrometry is today. The development of more sensitive, superconducting NMR systems is potentially a big leap forward for the technology.