UC SPCS Newsletter

School of Physical and Chemical Sciences/ Te Kura Matū

7th June 2019

Rudi's Weekly Report.

Kia ora koutou

Hope you had a great week. Although teaching is finished for now, we still have had a very busy week. We were able to host Greymouth HS for two days of experiments and demonstrations. A big thanks to Graeme, Ben, Sarah, Zach and Nathan for looking after our visitors and making sure that the experiments worked as expected.

This week, we had lectures by Konstantin Pavlov and Sarah Masters. Konstantin talked about his research on the development of improved methods for the detection of breast cancer, while Sarah talked about her research on the determination and prediction of molecular structures. Following on with research achievements, Professor Jack Baggaley was awarded the title of Professor Emeritus for his continuing work with NASA. Congratulations Jack!

In this week's newsletter, we have an article on Ernest Rutherford (to mark the Centennial of the splitting of the atom) written by John Campbell. We also have Owen Curnow as the featured staff member – please check them out.

Finally, a special mention to Sarah Lilley for organising this morning's welcome tea for new postgraduate students. It was great fun and the baking was amazing.

Have a great weekend, and hope you get a chance to enjoy the winter weather.

Nga mihi nui
Rudi

Decanting West- Part 1 - All student/Post docs to move to ER

As you know the Beatrice Tinsley (BT)building will be completed in just four months and academic staff and admin will move in this year.
As part of this process all students and post docs should already be moved from West building into their new space in Ernest Rutherford(ER).

Most are already in ER but to enable an efficient decant of West to BT we need all remaining students and post docs to make the shift to ER.

All student/Post doc offices and student shared spaces in West should be empty and clean by Friday 28th June. Inspections will take place 1st July.

Moving boxes are available from the photocopy area outside West 701. Please return them when you've finished with them.

Welcome Nassim Aimeur - Hosted by Sarah Masters

32 hours flying, 19000 km distance to come to Christchurch and work on a Chemistry Project! What a better proof that science really is universal? I am Nassim Aimeur and I am coming towards the end of my Masters degree in Analytical Chemistry at the University of Rennes, Brittany, France.

To complete my year I needed to do an internship! While I was looking for that placement, I heard someone saying that "travelling is the only thing you pay and enriches you". So I wondered what would happen if I combined travel and learning! This is how I, a 24 years old French/Algerian student, ended up here for a 3 month long chemical project.

I'm proud to be the first French/Algerian to come to UC and I am really enjoying my time here! I'm working with Sarah Masters and I'm based on the 5th floor of Ernest Rutherford. I am already getting to know lots of you.

Since I was a kid I've always been attracted to science and now I really love what I am doing!
But not only science; I adore dancing, learning foreign languages, eating and I am a real history lover. In life we can say I'm a curious guy, I like to discover what surrounds me, both nature and culture, I think to understand ourselves better we must first understand what is around us!
I think travelling is the best solution to discover the world, and that is why I love it!

My daily motto is "life is a party make it hot, dance, don't ever stop whatever the rhythm", that is, to say that life is tightly short so just let it go and live it the way you want, no matter what happens, no matter what people think! We all have to enjoy each moment, whatever it is! Live your life, go ahead but don't forget where you came from!

SPCS Staff Profile - Associate Professor Owen Curnow

As far as I know, all of my ancestors came to New Zealand in the 1840s-50s. Some came over on the Clifton, which was also called the Ship of Sorrows due to the tragic deaths of 46 passengers, mostly children, during the voyage. You can visit the house of my ancestor Thomas Gallagher, who was on that ship, at the Howick Historical Village.
Anyway, eventually circumstances conspired and I was born in Murupara a century or so later. I lived there for 7 years before moving to Hamilton where most of my extended family still live.

A fantastic high school chemistry teacher, Chris Cook, led me to study chemistry at the University of Waikato. This was a great learning environment for me at the time and I was fortunate to do my MSc with Prof. Brian Nicholson on Sn-Co clusters. I also did an undergraduate project with him as a second year student, and that gave me my first publication. I attribute that more to luck than expertise! Interestingly, we also published a nice paper on a Sn-Co cluster anion that has been cited quite a lot, but for the counter-ion that we thought was not very interesting!

Itchy feet took me to the US on a Fulbright Travel grant where I pursued my PhD at The University of Michigan with Prof. M. David Curtis. Amongst the highlights were sitting with 100,000+ close friends at the football games. Quite an experience, although I was quietly relieved that first year PhD students were seated on the 40 yard line and not with the first year undergraduates…. The chemistry started well with a couple of Nb and Ta complexes, but this was immediately followed by a frustrating two or three years trying to make sulfide clusters with these.

Associate Professor Owen Curnow's early research at Canterbury focussed on the organometallic chemistry of indenyl complexes and tethered phosphine-cyclopentadienyl complexes before moving to ionic liquids several years ago.

A friend suggested a change in research direction, so I jumped over to Mo-Co-S clusters as models for hydrodesulfurisation and quickly got lots of interesting results. I think I ended up with more publications for my supervisor than any of his other students.
In 1992, I went to Dartmouth College, New Hampshire, for a post doc with Prof. Russell Hughes. Highlights there included learning to ski in the small town of Lebanon where I lived, and the amazing fall leaves. Research wise, a couple of JACS papers on organometallic complexes with fluorinated ligands kept my boss happy. One was on a long sought-after complex of the perfluorinated cyclopentadienide $C_5F_5^-$. Perfluorinated ferrocene, $Fe(C_5F_5)_2$, is still undiscovered, despite many attempts by many researchers to make it.

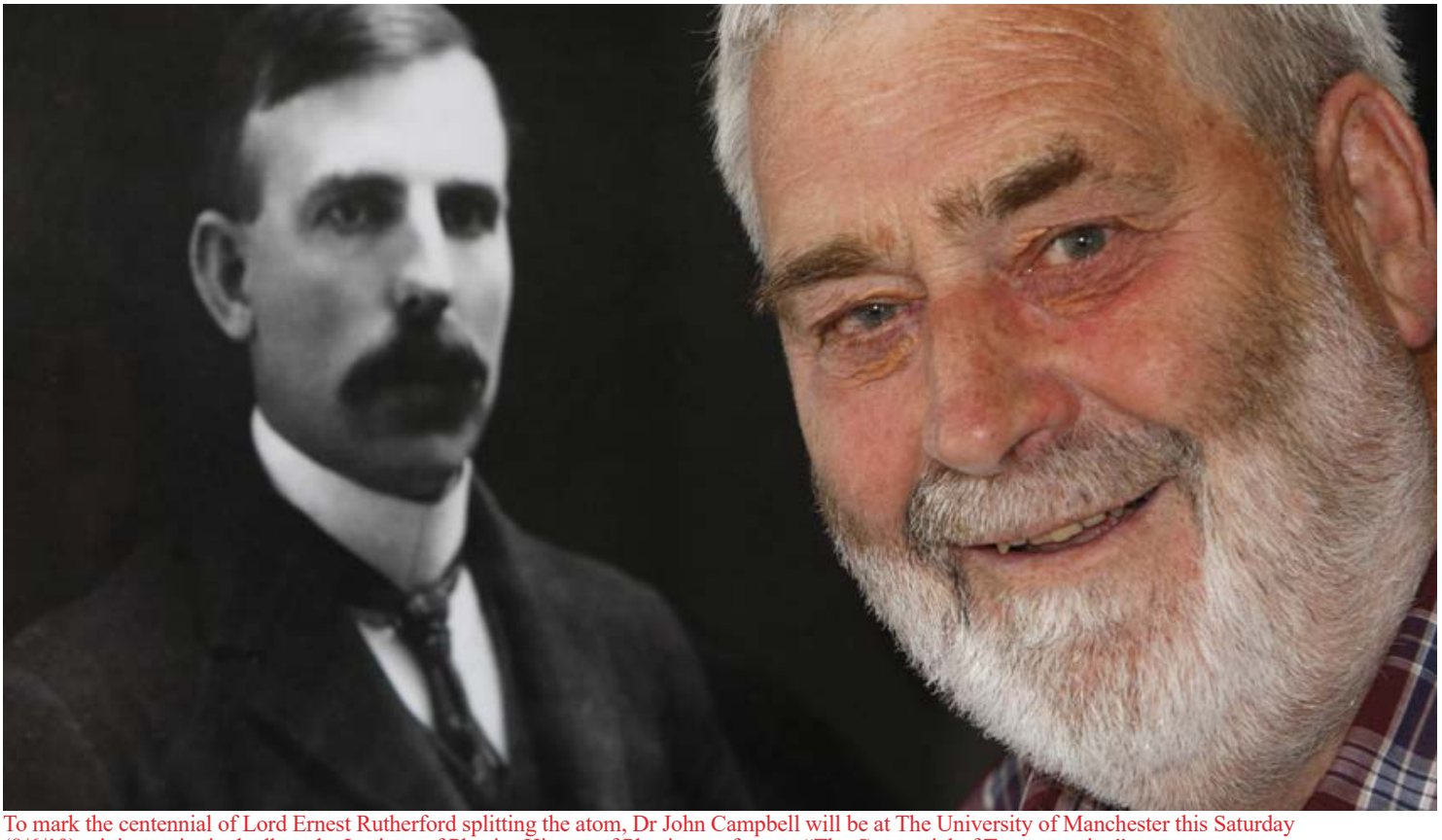
Next stop was an Alexander von Humboldt Fellowship to work with Prof Gottfried Huttner at Universität Heidelberg in Germany. There I worked on In-Cr clusters and chelated-phosphine complexes; the latter were to form the basis of my early work at Canterbury. Heidelberg is a beautiful city that was largely untouched by the Second World War. I especially recommend Vetters 33, a 33% alcohol beer.

My early research at Canterbury focussed on the organometallic chemistry of indenyl complexes and tethered phosphine-cyclopentadienyl complexes before moving to ionic liquids several years ago. My research seems to have migrated around the periodic table (I think I've published new compounds with about 20% of the periodic table, without specifically trying to do that. It's about 25% of the table if you include elements that I've used along the way). Anyone interested in a lanthanide project?

More recently, we've become interested in polyhalides like $[I_2Br_6]^{2-}$, in addition to an ongoing interest in chloride hydrates like $[Cl_2(H_2O)_6]^{2-}$.

Outside of research, I did karate for several years during the early parts of my career at Canterbury, but now I get my exercise mostly from badminton, when I'm not injured anyway!
A return to karate might be a safer option…. Although photography and Call of Duty are hobbies, I'm also a semi-professional driver. Or at least I would be if my children paid me.
My son is now grown-up, but my daughters are 12 and 14 and they keep me busy with driving and out-of-town competitions for rhythmic gymnastics and, more recently, cheerleading. I'm an honorary "gym mum".

The Centennial of Ernest Rutherford Splitting the Atom- Dr. John Campbell



To mark the centennial of Lord Ernest Rutherford splitting the atom, Dr John Campbell will be at The University of Manchester this Saturday (8/6/19), giving an invited talk to the Institute of Physics History of Physics conference "The Centennial of Transmutation".

It was 100 years ago this week that Ernest Rutherford split the atom/became the world's first successful alchemist/ induced the word's first nuclear reaction.

To mark the occasion, I will be at Manchester this Saturday (8/6/19), giving an invited talk to the Institute of Physics History of Physics conference "The Centennial of Transmutation".

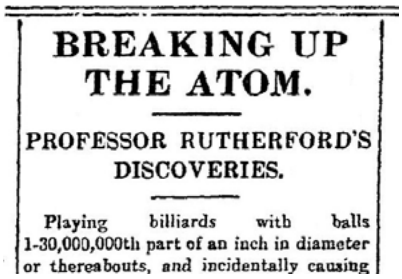
My talk is "Rutherford's Road to Splitting the Atom", starting with the formation of the Student Science Society at Canterbury College in 1891.

Rutherford bombarded light gases (H2, O2, N2, CO2) with alpha particles and observed the nuclei of these gases recoiling, by distances that depended on their mass. For example, the hydrogen nuclei, being only a quarter of the mass of the alpha particle, recoiled at a speed of 1.6 times the speed of the incoming alpha particle. Being only half the charge on the alpha, it travelled a distance in air of four times that of the alpha particle. He found that when he used air or pure N2 he still saw hydrogen nuclei recoiling. He concluded, after much careful experimental work, that the recoiling hydrogen nuclei had been part of the nitrogen nucleus. He had transmuted nitrogen into hydrogen. I found that this led to all sorts of quake claims of alchemy, particularly in turning mercury into gold. Even a German economist stated that Germany would repay its crippling war reparations in this way.

Fellow invited speakers include experts talking on such fields as the history of the nuclear force, the physics laboratories at Manchester 1900-1919, news media coverage of the events, and some chemical consequences of induced transmutation.

John Campbell is a retired staff member from the Department of Physics and Astronomy, author of "Rutherford Scientist Supreme" and www.rutherford.org.nz, and the producer of the 3-hour DVD "Rutherford."

In 1971 these two stamps were issued to commemorate the 100th anniversary of Lord Rutherford's birth.



BREAKING UP THE ATOM.

PROFESSOR RUTHERFORD'S DISCOVERIES.

Playing billiards with balls 1-30,000,000th part of an inch in diameter or thereabouts, and incidentally causing

Text book donation

Sharlene Wilson

I'm arranging a large donation of text books but I need to know how many we have in good order <10yrs old so I can arrange transport.
Can you please email me with the approx. number you have to donate.

Prof Ian Shaw on TV

"How Not to Get Cancer"- episode 1 screens TV One, Tuesday July 09, and Prof Ian Shaw will be in the 4th episode, July 30.

Particle telescope technology could help improve radiotherapy

Spotted by Prof David Wiltshire in Physics World.

At the heart of the new AGILE telescope is the SAMPIC chip, which provides fast sampling, low power consumption, good radiation tolerance and built-in data reduction. (Courtesy: Christophe Royon)

A research team at the University of Kansas (KU) is developing a particle telescope to analyse charged particles emitted by the sun. The technology could also be used to measure doses delivered to patients during radiation therapy.

https://physicsworld.com/a/particle-telescope-technology-could-help-improve-radiotherapy/

Photo published in Wilderness Magazine –Prof. Bryce Williamson

https://www.wildernessmag.co.nz/hypothermia-the-silent-menace/

Photo credit-Bryce E. Williamson.
It was taken on Fantham's Peak, the shoulder peak of Taranaki. The person in the photo is Jonathan Carr, who will be known to a few people in the School. The hut is called Syme Hut and is named after Rod Syme (senior) our own Rod Syme's father – who was a prominent mountaineer – see https://teara.govt.nz/en/biographies/4s59/syme-roderick