UC SPCS Newsletter

School of Physical and Chemical Sciences/ Te Kura Matū

5th June 2020

Welcome to our SPCS newsletter for 2020.
Please send me your news articles, photos, travel diaries, conference reports or funnys by 9am each Friday.
Email sharlene.wilson@canterbury.ac.nz
You can find previous issues here https://www.canterbury.ac.nz/science/

Facebook(@PhysandChematUC)
Twitter (@UCNZ_PhysChem)
WeChat(Physical&ChemicalSciences)

Rudi's Weekly Report.

Kia ora koutou

Hope all is well, and that you had a great week. First of all, I would like to thank everyone for all their hard work during the term.
It has not been an easy semester to navigate through, but we have managed to come through largely intact.
Exams are now on the horizon, and John and Orlon have been working very hard to make sure that we have the right tools to be able to mark exams on-line quickly and efficiently. Thanks guys!
Although we are likely to be moving into alert level 1 in the next few days and with that, and increased return to normalcy we need to make sure that we are ready should we require to move back into level 2 or 3.

Anthea, Cliff, Orlon and Nathan have been working flat out to make sure that our labs are ready should we need to change things at short notice. Awesome work!

I am saddened to report the loss of two members of the extended SPCS family, Dr. Edward Hearnshaw and Dr. Michael Moore. Dr. Edward Hearnshaw was a principal Policy Analyst for the NZ Ministry for the Environment. Dr. Michael Moore got his PhD at UC and was a practicing patent attorney in Sydney. I would like to take to express the school's condolences and sympathies to John and Vicky Hearnshaw, and to Michael's family.

On a more upbeat note, research is still moving forward and we still have 5 Marsden and 1 Endeavour proposals in contention for funding. The environmental chemistry lab in level 2 is now running, and we are hopeful that the synthetic chemistry lab in level 5 will be equipped shortly. In the last few days, the research in the school has been on the spotlight, please check out the interviews with Karen, Michele, Sally and Dan.

Have a great weekend, and I look forward to seeing everyone next week.

Visualize Your Thesis

Prizes

1st prize $1000.00 (and entry into the international Visualise Your Thesis competition)
2nd prize $500.00
3rd prize $250.00

Who can enter?

Postgraduate students (Master's, PhD and Professional Doctorate programmes) at any stage of their research based degree who are currently enrolled.

What is the timeline?

1 June – 31 July 2020:
Entries are open.

21 August 2020:
Winners are announced

Get more information here https://canterbury.libguides.com/c.php?g=928861&p=6710712

Health, Safety and Wellbeing- Sharlene Wilson (H&S Administrator)

Beatrice Tinsley Evacuation Assembly Area

The assembly area for the Beatrice Tinsley building is north of the building and adjacent to the Engineering Core and Link Blocks. Please assemble well clear of the Beatrice Tinsley Building.

Fire Floor Wardens:

Level 1 – Anna Chapman

Level 2 – Rebekah Hunt and Alex Nichols

Level 3 – Tim Allison

Level 4 – Richard Hartshorn and Sharlene Wilson

Evacuation Assembly Area

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Check out the SPCS H&S LEARN site for more. https://learn.canterbury.ac.nz/course/view.php?id=5185

Publications

Atomic Scale Dynamics Drive Brain-like Avalanches in Percolating Nanostructured Networks
Matthew D. Pike, Saurabh K. Bose, Joshua B. Mallinson, Susant K. Acharya, Shota Shirai, Edoardo Galli, Stephen J. Weddell, Philip J. Bones, Matthew D. Arnold, and Simon A. Brown*
Nano Lett. 2020, 20, 5, 3935–3942
Publication Date:April 29, 2020
https://doi.org/10.1021/acs.nanolett.0c01096
2020 American Chemical Society

A. J. Fairbanks, Glycosylation through intramolecular aglycon delivery, in 'Comprehensive Glycoscience', 2nd Edition', Eds. J. Barchi, S. Vidal, Elsevier, 2020.
https://doi.org/10.1016/B978-0-12-409547-2.14950-9

Mohammed S. Abdelbassit, Owen J. Curnow, Manuel Ferreras and Deborah L. Crittenden. A Discrete Dichloride Tetrahydrate Trapped by a Cyclopropenium Cation: Structure and Spectroscopic Properties, ChemPlusChem, 2020, 85, 927–932.

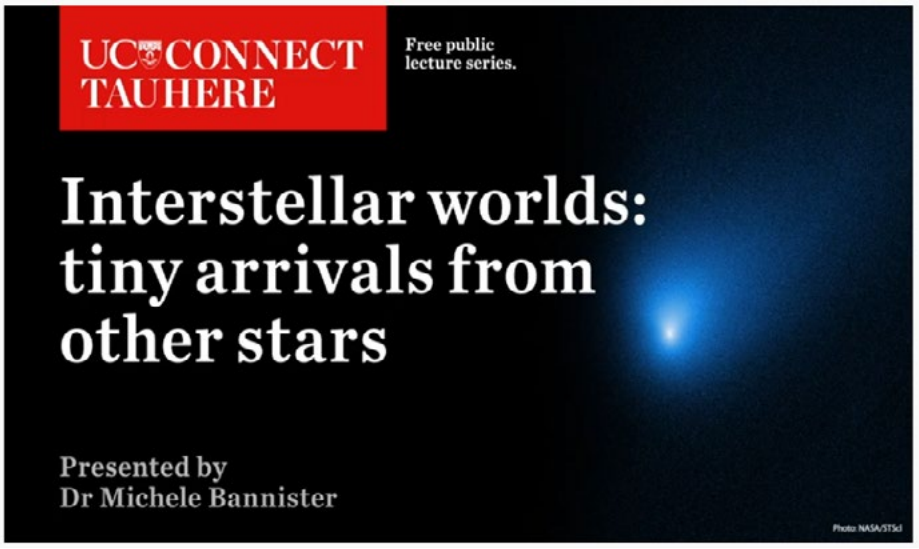
Owen J. Curnow, Chaminda D. Jayasinghe, Matthew I. J. Polson and Ruhamah Yunis. Triaminocyclopropenium Halide and Triiodide Salts: The Formation of Cyclopropenium Dimers. J. Chem. Crystallogr. 2019, https://doi.org/10.1007/s10870-019-00809-1.

Brendan Coleman, Dylan Paterson, Chris Gordon, Oscar Macias, Harrison Ploeg
Maximum Entropy Estimation of the Galactic Bulge Morphology via the VVV Red Clump
arXiv:1911.04714 [astro-ph.GA]
https://arxiv.org/abs/1911.04714

ß Pictoris: observations of the CaII H&K absorptions in 1997 and 1998
William Tobin, Stuart I. Barnes, Stephen Persson & Karen. R. Pollard.
Monthly Notices of the Royal Astronomical Society, 489, 574-593 (2019)
plus numerous on-line files

UC Connect: Interstellar worlds - tiny arrivals from other stars

Presenter: Dr Michele Bannister, Lecturer in Astrophysics, College of Science
Internationally renowned University of Canterbury (UC) astrophysicist Dr Michele Bannister will take us on a journey to explore interstellar worlds in her free UC Connect public talk at the University of Canterbury.



UC Science Radio

Shedding light on dark matter.

Dark matter makes up the majority of the universe but remains a mystery to science. Dr Chris Gordon shares his lifelong study of the shadowy substance and explains why physicists like him are so captivated by it. Listen here

Ending our love affair with plastic.

Lightweight, strong, waterproof – plastic is a wonder material, but it's not so wonderful for nature. Dr Sally Gaw explains what plastic is doing to our environment, where it's ending up, and how we can fix the problem.
Listen here

The Evening Sky in June 2020- Alan Gilmore

Sirius is the 'evening star'. At the beginning of the month it appears due west at dusk and sets in the southwest before 10 pm. By the end of June it sets at 8 pm. Being bright and white, Sirius twinkles with all colours when low in the sky.

Mercury is low in the northwest for much of the month, setting 80 minutes after the Sun (so not on the chart). It fades as it moves between us and the Sun and more of its sunlit side is pointed away from us. It sinks into the twilight at the end of June.

Jupiter is the brightest 'star' in the later evening. It rises in the southeast after 8 pm at the beginning of the month. By June's end it is up after 6 pm. Jupiter shines with a steady golden light. Saturn is just below Jupiter. It looks like a cream-coloured star. The Moon will be above Jupiter and Saturn on the 8th and below them on the 9th. Jupiter and Saturn are good targets for small telescopes. Jupiter's disk is obvious, even in binoculars. A telescope shows its four 'Galilean' moons lined up on either side. It is 640 million km away. A small telescope shows Saturn's rings and its biggest moon, Titan, about four ring-diameters from the planet. Saturn is 1370 million km away mid-month.

Mars rises due east before 1 a.m. through the month. It look like a bright orange-red star. The Moon will be above Mars on the morning of the 13th and below Mars on the 14th.

Canopus, the second brightest true star, is higher in the southwest sky, swinging lower in the south later. Canopus is 310 light years away and 13,000 times brighter than the sun. Arcturus is a lone bright star in the northeast. Its orange light often twinkles red and green when it is low in the sky. It sets in the northwest in the morning hours.

Crux, the Southern Cross, is south of the zenith. Beside it and brighter are Beta and Alpha Centauri, often called 'The Pointers' because they point at Crux. Alpha Centauri is the closest naked-eye star, 4.3 light years away. Beta Centauri and many of the stars in Crux are hot, extremely bright blue-giant stars around 550 light years away.

Antares is a medium-bright orange star midway up the eastern sky. It marks the scorpion's body. Antares is a red giant star: about 600 light years away and 19 000 times brighter than the sun. Red giants are much bigger than the sun but cooler, hence the orange-red colour. Below Scorpius is Sagittarius, its brighter stars making 'the teapot'.

The Milky Way is brightest and broadest in the southeast toward Scorpius and Sagittarius. It remains bright but narrower through Crux and Carina then fades in the western sky. The Milky Way is our edgewise view of the galaxy, the pancake of billions of stars of which the sun is just one. The thick hub of the galaxy, 30 000 light years away, is in Sagittarius. A scan along the Milky Way with binoculars will find many clusters of stars and some glowing gas clouds. Relatively nearby dark clouds of dust and gas dim the light of distant stars in the Milky Way. The dust clouds look like holes and slots in the Milky Way. These clouds eventually coalesce into new stars.

The Clouds of Magellan, LMC and SMC, in the lower southern sky, are luminous patches easily seen by eye in a dark sky. They are two small galaxies about 160 000 and 200 000 light years away. The Large Cloud is about 5% the mass of the Milky Way; the Small Cloud is about 3%.

Venus is the brilliant 'morning star'. It moves quickly up the morning sky, dawn to dawn, rising an hour before the Sun on June 10th and two hours before by the 20th. The Matariki/Pleiades star cluster is left of Venus from mid-month, when the cluster is first seen, till the end of June. The crescent Moon will be above Venus and Matariki on the morning of the 19th.

Coalsack nebula, left of Crux, looks like a hole in the Milky Way. It is a cloud of dust and gas 600 light years away, dimming the distant stars in the Milky Way. Many 'dark nebulae' can be seen along the Milky Way, appearing as slots and holes. These clouds eventually form new stars.
The Jewel Box is a compact cluster of young bright stars about 7000 light years away. The cluster formed about 16 million years ago. To the eye it looks like a faint star close by the second-brightest star in Crux. A telescope is needed to see it well.

Omega Centauri, nearly overhead, is a globular cluster, a ball-shaped cluster of millions of stars. Its total mass is six million times the sun's mass. It is 17 000 light years away and 200 light years across. Globular clusters are very ancient, around 10 billion years old, twice the age of the sun. Omega Centauri is the biggest of the hundred-odd globulars randomly orbiting our galaxy. It may originally have been the core of a small galaxy that collided with the Milky Way and was stripped of its outer stars. 47 Tucanae, near the SMC, is a similar but smaller cluster about 16 000 light years away.

Centaurus, with the bright 'Pointers', and Crux, the Southern Cross are south of overhead, the tightest grouping of bright stars in the whole sky. Originally Crux was the hind legs of the Centaur, the horse-man of Greek mythology. The complete Centaur, with bow, is outlined at left. It was only in the 17th Century that Crux was split off as a separate constellation. The slow wobble of Earth's axis allowed this part of the sky to be seen from more northerly places in ancient times. The fainter Pointer and the three bluish-white stars of the Crux are all super-bright stars hundreds of light years away. Alpha Centauri is just 4.3 light years* away and the reddish top star of Crux is 90 light years from us.