

UC



SPCS Newsletter

School of Physical and Chemical Sciences/Te Kura Matū

24th April 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

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

Rudi's Weekly Report.

Kia ora koutou

Hope you and your loved ones are safe and sound. First of all, I would like to thank everyone for all their hard work to get the School ready for being able to deliver our courses on-line this term. Please don't forget about all the on-line resources available for you to access including the multimedia lectures on biomedical and life-sciences.

This coming week we will moving into level 3 lockdown, and although significant restrictions remain, it is move in the right direction.

We are working with the other schools in the college on a common approach that might allow us to re-start some of our research activities in a safe and sustainable manner.

Despite the lockdown, we have a number of things to celebrate this week particularly in the field of Astronomy. Dr. Michele Bannister was awarded the 2020 Zeldovich Medal for her excellent research.

Associate Professor Karen Pollard is part of an international team that has revealed how explosions on the surface of a white dwarf star can increase its brightness by thousands or millions of times making it look like a new star – it is an amazing article in Nature Astronomy.

As we continue with the lockdown, please don't forget to keep in touch with your friends and colleagues.

We have a number of stories, photos and activities on what our friends and colleagues have been up to. Please take a look, and feel free to share your stories and anecdotes (and funny memes).



Kia kaha
Rudi

Anzac Day #StandAtDawn <https://www.standatdawn.com>

Anzac Day is one of the most important national occasions for both Australians and New Zealanders. In 2020, for the first time in history, Anzac Day Services across New Zealand have been cancelled due to COVID-19. Even though public An-

zac Services are unable to go ahead, it does not mean that the tradition of remembering and commemorating our veterans and service personnel should be cancelled too. The RSA and New Zealand Defence Force would like you to join us to

remember those who given their lives for our country. This is a time to pay respect and acknowledge the many thousands of our military people who are serving or have served, who are called upon to support New Zealand in times of war, conflict and disasters. Join us at 6:00 am on Saturday 25 April. Stand at your letterbox, at the front door, in your lounge rooms, balconies, in your driveway. Wherever you are in the world, stand with us and take a moment to remember our fallen – but please stay within your 'bubble'.

Tune into Radio NZ National and Newstalk ZB (AM & FM frequencies), listen live on the internet or on your phone([download app here](#)) for the official dawn service broadcast commencing at 6:00 am.



Get Better Zoom Backgrounds

For those who would like to use some beautiful Canterbury backdrops for Zoom you can check these out.

<https://www.christchurchnz.com/explore/explore-your-place/zoom-canterbury-backgrounds>

Online Multimedia Video Lectures on Biomedical and Life Sciences

University of Canterbury recently became a subscriber to the The Biomedical & Life Sciences Collection and all staff and students have unlimited access. Henry Stewart Talks offer a great source of online content which faculty can use to supplement their own teaching.

•The collection is listed as a whole on our webpages at <http://library.canterbury.ac.nz/webapps/>
Individual items in the collection can be found

•Via the library catalogue, for example

<https://ipac.canterbury.ac.nz/ipac20/ipac.jsp?profile=a&ri=&index=BIB&term=2815810>

•Via MultiSearch (the general search engine on the library website and also on the CHEM/BCHM subject guides), for example

<http://tinyurl.com/yx7polwg>



Electrical Safety at Home

As we are all working at home during this quarantine period, here are some safety points from our super awesome workshops electrical experts:

•When working from home, avoid plugging all your equipment into one circuit/plugboard, try to split it across two wall outlets if possible.

•With colder days coming, definitely do not just throw an electric heater be it a fan heater or oil column heater onto the same circuit as all your computer gear.

•Occasionally check the temperature of your plugboards/cables by touch, they should not be any warmer than room temp, anything running slightly warm should have it's load reduced.

•If you have to run extension leads to your workstation, route them away from doorways or high traffic areas where they'll be walked on.

•Where possible, shut everything down at night.

Beautiful As The Moon!

A big Congratulations to Dr. Ali Atharifard (MARS Bioimaging) and his wife Fateme on the arrival of their beautiful daughter Mahta on the 13th March.

Mahta means "beautiful as the moon".

Congratulations Ali and Fateme!



Congratulations Michele!

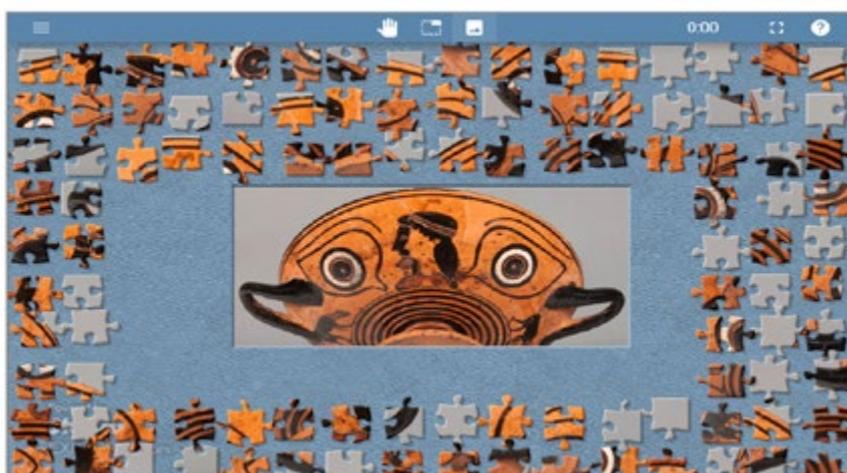
Please join me in congratulating Dr. Michele Bannister on being awarded the 2020 Zeldovich Medal for COSPAR Scientific Commission B.

The Zeldovich Medals are given to young scientists who have demonstrated excellence and achievement in their field of research. They are conferred by COSPAR and the Russian Academy of Sciences and honor the memory of the distinguished astrophysicist Academician Yakov B. Zeldovich.

This is a massive honour for Michele and the wider University!
Well done Michele! We are all super proud of you!

Jig Saw Fun!

Can you solve the puzzle of the Athenian black-figure eye cup? One of many new online resources for the Children's University from the Teece Museum's awesome team. <http://teecemuseum.nz/learn/brainteasers/jigsaw-logie-cup/>



Lockdown Living

Staff sharing photos and stories of their life in lockdown.



The Great NZ Baking Book Project- Rodrigo Martinez Gazoni

I thought I would send you what we have been doing with the extra hour that we get every day since we stopped commuting to work. I will start with Rocio and I will tell you about my stuff next time.

As you might already know, my lovely Rocio fell in love with New Zealand when she was a teenager without even visiting the country. A few year later she consolidated that love later during her first solo trip. Long story short:

this was one of the reasons why we are here today!

Another thing you might know about my Rocio is that she looves baking and she is really, really good at it. Last year she decided to combine her two passions (New Zealand and baking) and challenged herself to bake all the recipes of The Great New Zealand Baking Book. To keep a record of this, she started a blog where she post the recipes and the results of her baking, along with her thoughts, tips and

tricks for each one. During lockdown, she has been using the extra time she saved from not having to commute to her job to bake some more and I thought I would share some of her results.

If you feel like baking yourself, you are welcome to check out her blog/instagram for recipes, tricks and advice. <https://thegreatnzbakingbookproject.home.blog/>



In My Happy Place - Jan Wikaira

I've been documenting my daily beach walks (How lucky am I) with a photo each day. I think this was day 13.



The Atmospheric Group's Daily Zoom - Laura Revell

The atmospheric physics group meet on Zoom for a daily catchup.



Lockdown Home Baking - Fraser Gunn

Some of the yummy baking that we've been doing at home. Rhubarb pie, blackberry pie, chocolate cake, banana loaf, pizza, chocolate banana loaf, banana caramel, and quince pie. Not looking forward to next months power bill, but all were very yummy :-)



William Tobin From France

William Tobin gives a view of the lockdown in France.

President Macron addressed the nation on Monday night at 20.02, timed so as not to clash with the nightly 8pm countrywide burst of clapping and saucepan bashing that expresses thanks to the valiant efforts of health workers in the Covid-19 crisis. This was M. Macron's fourth coronavirus address. In the first he was visibly agitated. In the second he likened the fight against the virus to a war. I disapprove of this simile, because the epidemic is nothing like a war. There is no hostile enemy, there is no shortage of food, there is no destruction of property, essential services are uninterrupted and there is no possibility of losing against the virus. Ultimately, the pandemic will die out.

On Monday the President was more subdued. He announced an extension of the lockdown for a further four weeks, with the expectation that restrictions may be eased, but by no



The pleasure port in Vannes, close to the town centre, 200 metres from our house. Normally the esplanade is teeming with people.

means eliminated, from May 11. He didn't say it, but for oldies like me (I'm 67) the advice is surely going to be 'stay home as much as possible' until a vaccine becomes available in quantity, which is a year away at least. Here, New Zealand/Aotearoa will be blessed if its elimination strategy works. A hard and early lockdown coupled with test-trace-confine may work for Godzone's more spread-out, isolated and less-infected population. Virus-free status may be achieved in only a few weeks, permitting much of the economy to restart, and could be maintained through quarantine of all arriving international travellers until a vaccine becomes available. This is only possible for an isolated, island nation. Unlike here in France where elimination is not an option, kiwi oldies may not need to remain isolated any longer than the general population. My late father was a virologist and epidemiologist. I would so much like to have had his opinion on SARS-CoV-2 and how to deal with it. On a personal level, confinement doesn't weight too heavily on me and my wife Laurence; indeed, we are almost enjoying the simpler rhythm. We live in Brittany, in the west of France, in a region with relatively few Covid cases.

Read the full blog here <http://quake-journey.blogspot.com/2020/04/day-20-day-6-william-tobin-from-france>.

Astronomers discover the science behind star bursts that light up the sky.

University of Canterbury (UC) astronomers are part of an international team that has revealed how explosions on the surface of a white dwarf star can increase its brightness by thousands or millions of times making it look like a new star.

For many years astronomers have thought that nuclear fusion of material on the surface of a white dwarf directly powers all the light from a nova explosion, which happen about 10 times a year in our galaxy.

A nova, or stella nova – Latin for “new star” – is a sudden explosion on the surface of a white dwarf, which is the hot, burnt-out core of a star. It produces an incredible amount of energy and light, increasing the star’s brightness by thousands or even millions of times. If a nova occurs relatively close to earth it can appear as a new star to the naked eye.

In new research, a team of international astronomers has shown that “shock waves” from the nova explosion, rather than nuclear fusion, cause most of the brightness. The team used NASA’s space-based telescopes and ground-based telescopes, including some at the UC Mt John Observatory in Tekapo, to observe a recent nearby nova in the constellation of Carina and proved that it is indeed shock waves that cause most of the nova’s brightness.

Their results are documented in a new paper called “Direct evidence for shock-powered optical emission in a nova” published this month in the international journal [Nature Astronomy](#).

UC Associate Professor in Astronomy and Director of the University of Canterbury Mt John Observatory [Karen Pollard](#), who co-authored the paper, was observing at UC’s Mt John Observatory using the McLellan telescope and HERCULES spectrograph a few days after the bright nova in Carina was reported.

“I was excited to observe it – a new bright novae in the galaxy is an important opportunity to make a detailed study of the nova’s properties and how these change with time. Using spectroscopy we were able to examine shock-produced emission and calculate how energetic the shock waves were and how fast the shocked material was moving,” she says. Elias Aydi, a research associate in Michigan State University’s (MSU) Department of Physics and Astronomy and lead author of the paper, says the discovery leads to a new way of understanding the origin of the brightness of novae and other stellar explosions. “Our findings present the first direct observational evidence, from unprecedented space observations, that shocks play a major role in powering these events.”

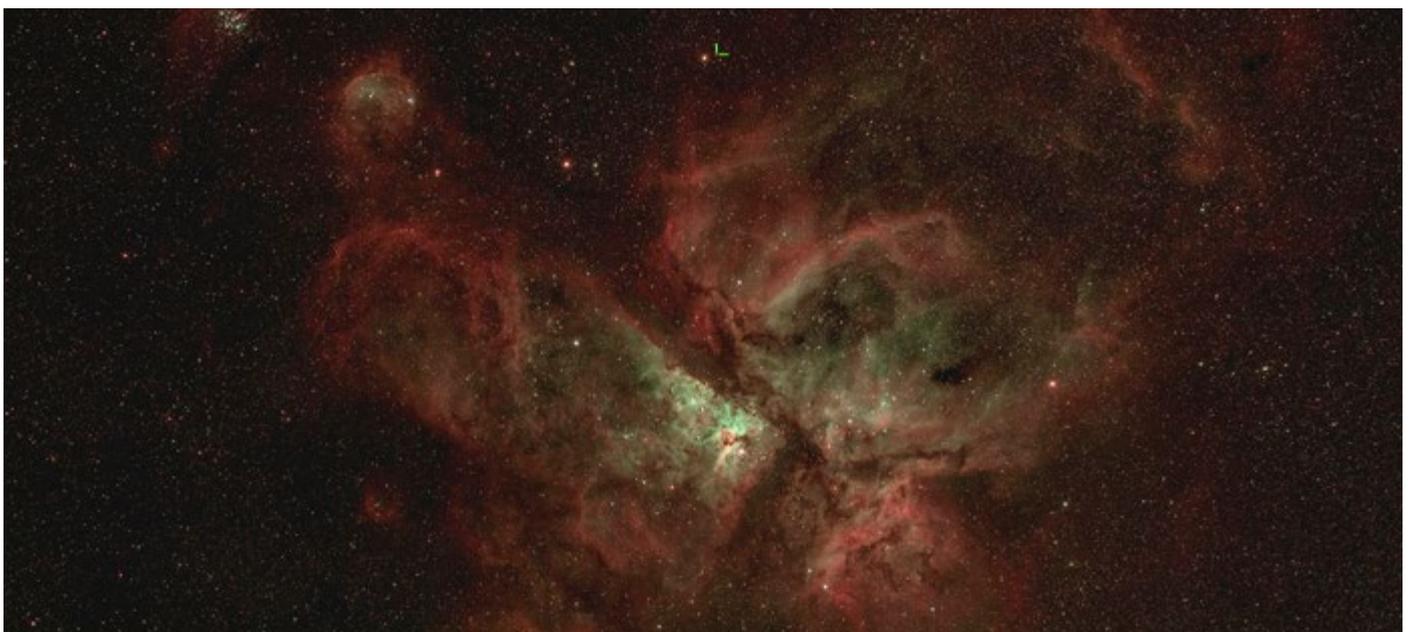
When material blasts out from the white dwarf, he says it is ejected

in multiple phases and at different speeds. These ejections collide with one another and create shocks, which heat the ejected material producing much of the light.

Another side effect of astronomical shocks are gamma-rays, the highest-energy kind of electromagnetic radiation. The astronomers detected bright gamma-rays from the star, known as nova V906 Carinae (ASASSN-18fv), whose explosion in the constellation Carina was first detected in March 2018.

An optical satellite happened to be looking at the part of the sky where the nova occurred. Comparing the gamma-ray and optical data, the astronomers noted that every time there was a fluctuation in gamma-rays, the light from the nova fluctuated as well. The simultaneous fluctuations in both the visual and gamma-ray brightness confirmed that both were originating from shocks.

The research team estimates that V906 Car is about 13,000 light years from Earth. This means that when the nova was first detected in 2018, it had actually happened 13,000 years ago. The new information may also help explain how large amounts of light are generated in other stellar events, including supernovae and stellar mergers, when two stars collide with one another. Each nova explosion releases about 10,000 to 100,000 times the annual energy output of the Sun.



The Great Nebula of Carina, with the position of the bright nova (nova V906 Carinae or ASASSN-18fv) indicated. This is an average of ten 300-second ISO 800 exposures, taken using a Canon 5ds camera on a Takahashi FSQ85ED telescope. Image credit: UC/Fraser Gunn, Observing technician, UC School of Physical and Chemical Sciences, University of Canterbury, on 2 April 2020 at the University of Canterbury Mt John Observatory.

Library Services under COVID-19 Alert Level 3- John Arnold

Please note that it may take a few days to get fully up and running owing to the administrative and Health and Safety requirements.
<https://www.canterbury.ac.nz/library/support/covid-19/#47882>

Information For All Library Users

Under alert level 3 (28 April - further notice) - all library locations remain closed to borrowers.

Library staff are providing online services from home.

We are now able to offer some additional services for academic staff and postgraduate students to aid teaching and research (see below)

- Your loans will be extended, so don't worry about overdues. We have temporarily disabled the renewal function in MyAccount as the Library is extending loan dates automatically.
- Please don't return your books and items to the library. All returns bins are closed.
- Fines have been disabled and existing fines waived.
- Library catalogue requesting is currently unavailable for undergraduates and external borrowers as we are unable to fill requests.
- You can [request interloans](#) for any articles which are unavailable online. All New Zealand and overseas libraries have suspended physical supply of books but electronic supply may be possible.

Services for UC Academic staff and Postgraduate students

Starting from Tuesday 28th April we will be offering the following services to aid with teaching and research.

Click and Post

From Tuesday 28 April UC Academic staff and Postgraduate students will be able to request items via the library catalogue (if you do not have this request option, contact library staff as it is limited to certain types of library accounts). Items will be retrieved daily (Monday - Friday) and posted to Academic staff and Postgraduate students. Items in some library storage locations will be unavailable for this service. Delivery times are subject to postal service operations. Postage is limited to within New Zealand only.

Scanning/digitisation

UC Academic staff and Postgraduate students can request scans of print resources (where an electronic copy of the resource is not available):

Email library@canterbury.ac.nz. Please include as much detail as you can e.g. chapters/articles required.

Access to Macmillan Brown heritage and culture collections

UC Academic staff can email library@canterbury.ac.nz to request access to the Macmillan Brown Library for the purpose of teaching.

You will need to provide evidence that the activity and necessary safety plan for the activity has been approved.

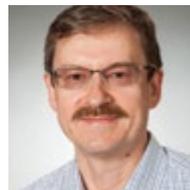
Access to Information Resources

- Explore a range of library resources you can access from home.
- Guidance on the online resources available for your subject are available through our Subject Guides
- Some of our publishers have made available resources beyond those covered by our subscription. A list of resources that publishers have opened up can be seen in our COVID19 Special Resources Guide. The guide also contains a list of publishers who are providing free access to journal articles about Covid-19.

Library Liaison Officer for
Chemistry
Assoc. Prof. Greg Russell
<http://bit.ly/2SvmiJd>



Library Liaison Officer for
Physics and Astronomy
Dr Konstantin Pavlov
<http://bit.ly/31z5tCP>



John Arnold
Subject Librarian for
Physical and Chemical
Sciences
<http://bit.ly/johnarnold-uc>

