

# space:exe conference

SPACE SCIENCE & ASTRONOMY

**2019**  
**17th March**  
**9:30 - 17:30**

## PROGRAMME

# about space:exe

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Space:Exe is a society at the University of Exeter for all the students who look up at the sky with wonder. Created 4 years ago, we believe that space is for everyone, whether you want to study its intricacies or enjoy its beauty. We have worked to build a radio telescope for students and the general public to use, as well as hosted stargazing events on campus where the vastness of the night sky can be appreciated.

We are also building a high altitude balloon, which we plan to launch soon, which will measure the carbon dioxide profile of the atmosphere as it ascends, as well as take beautiful photos of the curvature of the Earth.

We want to spread the love of space to as many people as possible; fostering a community at the University of Exeter for everyone who shares that love with us.

## the conference

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One thing we are passionate about as a society is sharing the wonders of the universe with everyone. This is one of the reasons we are delighted to be organising a second all-day conference devoted to all things space. Once again, we have some fantastic speakers coming from the University of Exeter, Met Office, University of Plymouth, Norman Lockyer Observatory, and our collaborators Caradon Observatory. This year we also have an open area where we have exhibitors from the Institute of Physics, Royal Astronomical Society, Norman Lockyer Observatory and others are coming along to show you some of the wonderful astronomy and space science related things going on in the South West.

To keep up to date, please do visit our Facebook event. Everyone is welcome to come along for a single talk or for the whole day. We look forward to seeing you.



# programme

Time	Talk
9:30	Registration
10:00	Plenary Talk
10:15	An Introduction to Astrophotography ..... Alexis Lau
10:45	Studying the Solar Wind with Multi Spacecraft Observations ..... Rungployphan Kieokaew
11:15	The Geological History of Mars and the Exploration of Martian Dunes ..... Kyle Lamb
11:45	Treating Cancer with Astrophysics ..... Freddy Wordingham
12:15	Lunch Break
13:30	Space:Exe Projects Update
14:00	Building a Muon Telescope (Everything is Broken) ..... Sammy Colburn
14:30	Educating the Next Generation of Astronomers ..... Mike Willmott
15:00	Coffee Break
15:30	The Use of Satellite-Derived Products in Operational Weather Forecasting ..... Martin Young
16:00	The History and Current Activities of the Norman Lockyer Observatory ..... David Strange
16:30	The Atmospheric Chemistry of Hot Jupiter Exoplanets ..... Dr. Eric Hébrard
17:00	Drinks Reception

# speakers

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## Alexis Lau

Undergraduate, University of Exeter



Astronomy has been a part of my life since I was in school. Knowing the sky is a hidden treasure, I would like to spread this interest. I have been participated in various events, for instance, introducing night sky to the public and organising astronomical camps for teenagers in Hong Kong.

The Night sky is what everyone has in common. Perhaps we have tried to take pictures or to identify the stars but no luck. Or we think that only professionals can understand the sky. Many of us still want to capture the moment we enjoyed and keep it as life memories. The presentation will introduce some basics for everyone to get started with astrophotography, mainly focus on landscape and lunar astrophotography, which only requires a camera and a tripod. Software related stargazing and image-processing will also be introduced.

## Rungployphan Kieokaew

Postgraduate, Centre for Geophysical and Astrophysical Fluid Dynamics, University of Exeter

We live under the influence of the Sun that is actively producing energetic particles through the solar system and affecting the space environments. Fortunately, the Earth is protected by its magnetic field that shields us from space radiation. Under certain conditions, solar wind entries can take place on the Earth's magnetospheric boundary. In this talk, I will give an overview of solar wind interactions with the magnetospheric boundary and our recent understanding through multi-spacecraft observations.



## Kyle Lamb

Undergraduate, University of Plymouth

In this presentation we will uncover the geological and morphological history of Mars, as well as a look into the presence of Martian dunes found within the polar regions and craters.

# Freddy Wordingham

Postgraduate, University of Exeter Astrophysics

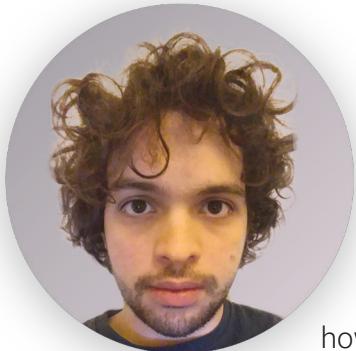
For millennia astronomers have been using the light coming from space to study the nature of the universe. Supercomputers can accurately represent this light travelling through simulations, allowing us to improve the physics and perform direct comparisons between models and observations. The same methods developed for these astrophysical codes can be directly applied to helping us better treat skin cancer here on Earth! Every day our skin is exposed to UV radiation from the Sun, increasing the likelihood of developing non-melanoma skin cancer; the most common form of cancer worldwide.



In his talk, Freddy will describe how code originally designed for simulating star formation has been modified to probe how photons travel beneath the skin, and can be used to activate drugs that effectively treat the tumour without expensive, invasive procedures and minimal cosmetic damage.

# Sammy Colburn

Undergraduate, University of Exeter



When most people think of telescopes, they picture an optical device used to image distant stars. However, we can, in fact, use the certain astrophysical phenomenon to produce an image, not of the night sky but instead image what is around us.

By using a constant stream of Muons from the atmosphere, and knowledge of how these muons will propagate through matter, it is possible to construct an image of the internal structure of objects by measuring the signal of the detector when facing the object. This technique has been used to find cavities in the great pyramids as well as image the internals of buildings.

In this talk, we will learn about the trials and tribulations suffered trying to build one of these telescopes from scratch.

# Mike Willmott

Caradon Observatory / Liskeard School

Mike Willmott is one of the resident astronomers at Caradon Observatory, where XRT-C is based. As well as being an experienced astronomer, he also has the privilege of teaching GCSE Astronomy at Liskeard School and Community College. He has taught astronomy for many years with the Cornwall schools astronomy project and has even taken a group of students to work on one of the major international observatories on La Palma in the Canary islands.



Mike will be talking about his unique perspective on educating the next generation of astronomers, the outreach projects going on at Caradon, and Cornwall as a whole, and along the way imparting a load of astronomy facts that will make you go "wow!"



# Martin Young

Deputy Chief Meteorologist, Met Office

I am a Deputy Chief Meteorologist at the Met Office in Exeter. I have spent much of my career in operational weather forecasting. I have also been involved in research into application of satellite imagery in weather forecasting as well as having assisted with training programmes at the Met Office College.

My talk will show how satellite products play a vital role in weather forecasting. I will present imagery from different satellite channels which reveal the rich variety of fascinating atmospheric structures and processes covering a wide range of scales. By interpreting satellite imagery in conjunction with other observational sources we can, in real time, identify and correct for errors in computer model forecasts as well as adding additional fine-scale detail. This can be of particular importance during episodes of severe weather.

# David Strange

Chairman, Norman Lockyer Observatory

David Strange is a retired farmer and has been an active astronomer and astrophotographer for the past 50 years. He is a member of the British Astronomical Association and a Fellow of the Royal Astronomical Society, as well as being the current chairman of the Norman Lockyer observatory in Sidmouth, Devon. His main interests include imaging comets, deep sky spectroscopy and the history of astronomy.



In his talk he is going to take us through the history of the Norman Lockyer Observatory, and work currently being undertaken by its members.

# Dr Eric Hébrard

Senior Lecturer, University of Exeter Astrophysics



Eric is an expert in chemical modelling of planetary atmospheres and studies a broad range of physical and chemical conditions, from the deep chill of our outer Solar System to the hazy skies of our own early Earth and further onto the blaze of the most recently discovered hot Jupiters. Within the astrophysics group at Exeter he is involved in the development and improvement of multidimensional chemical models of planetary atmospheres.

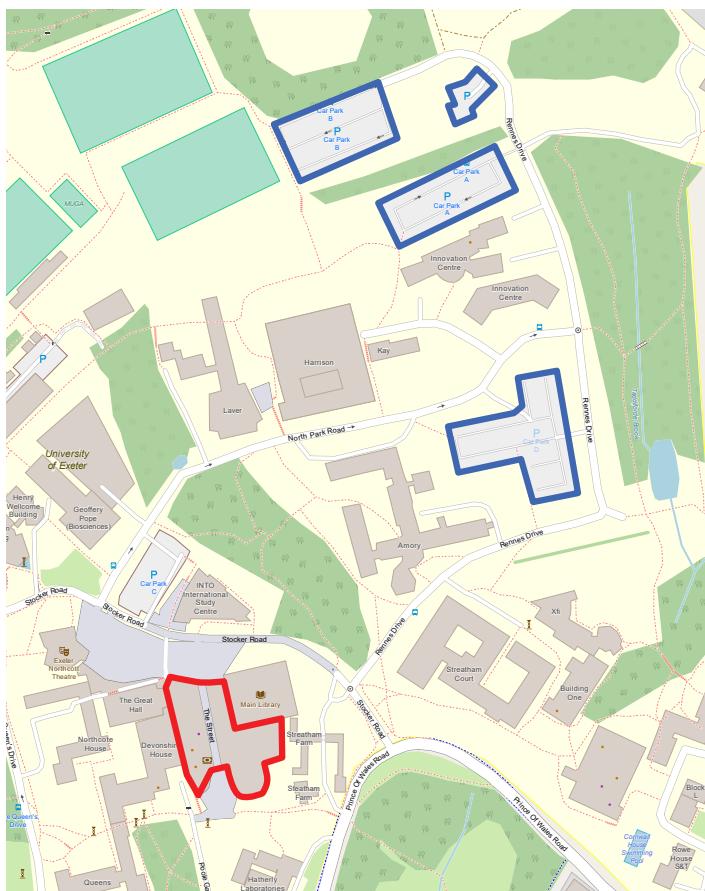
In this talk, Eric will be discussing the research of his group - using cutting edge climate models and chemical networks, using the same tech used to model the combustion engine in your car, to understand the physics going on in hot Jupiter exoplanet atmospheres.

# exhibitors

Along with the fantastic talks, we also have exhibitors outside of the auditorium. These include:



# getting here



The event is being held in the **Alumni Auditorium** in the **Forum Building**. The building is on the **Streatham Campus** of the University of Exeter. The building is marked at the the map with a red outline.

If you've coming by car, there is plenty of parking available on campus. There is on-road parking available on **Prince of Wales Road** as well as parking available in the university car parks (marked in blue outlines). There is also a park-and-ride scheme operating on the outskirts of the city.

You can also get to the campus by bus using the **D** bus service, which operates from the city centre.

**Address:**  
Forum, University of Exeter EX4 4SZ

## Local Organising Committee

Siddhant Deshmukh

Jacque Dieu

Matt Gent

Emily Glover

Alexis Lau

Matt McGuigan

Sam Morrell

Tobias Slade-Harajda

Sebastian Swiderski