

## TMS Committee 2018/19

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## Find us

Visit our website or join our Facebook group to find out more information about upcoming events and the society.

[tms.soc.srcf.net](http://tms.soc.srcf.net)

## Sponsors

We are proudly sponsored by Jump Trading and G-Research.



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## The Winstanley Lecture Theatre

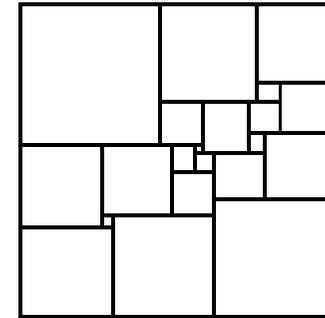
All of our talks are held in the Winstanley Lecture Theatre, Trinity College, unless stated otherwise.

Walk along Trinity Street to get to the Great Gate entrance of Trinity College. Opposite the Great Gate, there is a gate to Whewell's Court on the side of the street. After the first arch, go up the stone stairs and turn left at the second turn. Once you see some stairs on both your left and right, go up the stairs on the right and the theatre is through the doors.

If you cannot find it, then please ask the porters of Trinity College for directions.



## Trinity Mathematical Society 2019 Michaelmas Termcard



The squared square, a square with integral lengths with small such squares, is the logo of the TMS. Can you work out how to do it?

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The Trinity Mathematical Society, or TMS, was founded by a group of undergraduates at Trinity College, Cambridge in 1919 to promote a discussion about subjects of mathematical interest.

The society, we believe, is the oldest surviving subject society at university in the country. At this moment, we have over 800 members across Cambridge.

We hold numerous talks from esteemed academics and industry professionals, who give up an hour of their free time to explain a mathematical topic they are passionate about. We hope to see you there!

## Events

*Wednesday 9<sup>th</sup> October, 7:30PM*

### **TMS Freshers' Squash**

Held in the Junior Parlour

Come and meet all the other freshers who share a common interest in mathematics! We'll have plenty of free snacks and drinks so please come along and enjoy yourselves!

*Monday 14<sup>th</sup> October, 8:30PM*

### **Higher Dimensions**

Professor Imre Leader (DPMMS)

We are all used to thinking about shapes in 2 or 3 dimensions. But what about in 4 dimensions? Or even  $n$  dimensions, where  $n$  is large?

*Monday 21<sup>st</sup> October, 8:30PM*

### **The Universality Phenomenon**

Dr Roland Bauerschmidt (DPMMS)

Many complex systems in mathematics and physics show universal behaviour, i.e., behaviour that is independent of the details of the system. I will illustrate this universality phenomenon in several examples, some well-understood, some still mysterious.

*Monday 28<sup>th</sup> October, 8:30PM*

### **Is classical physics deterministic?**

Professor Mihalis Dafermos (DPMMS)

We are all taught that quantum mechanics suffers from lack of determinism. But classical, i.e. non-quantum, physics is supposedly deterministic: complete knowledge of initial conditions in the present uniquely determine the future. This notion of determinism is often associated with the name of Laplace, and finds a mathematical realisation in the standard existence and uniqueness theorems for differential equations. But is it really true that the classical equations of mathematical physics uphold this notion? This talk will explore one of the most spectacular ways that Laplacian determinism can in fact fail.

*Monday 11<sup>th</sup> November, 8:30PM*

### **Coffee stains, cell receptors, and time crystals: lessons from the old literature**

Professor Raymond Goldstein (DAMTP)

A paradox of our digital age is that while we can access the older literature more easily than ever before, all too often our focus is only on the latest postings to the arxiv. The purpose of this seminar is to illustrate, by means of a few key examples, the benefits that can come from reading the old literature. My goal here is to be mentorial, particularly toward younger scientists, to emphasise that the ability to ferret out the origins of ideas is an important skill. Besides being the right thing to do, it can make for more interesting papers and seminars, and can often reveal motivations that have been lost in time.

*Monday 18<sup>th</sup> November, 8:30PM*

### **High-dimensional data and the Lasso**

Dr Rajen Shah (DPMMS)

How would you try to solve a linear system of equations with more unknowns than equations? Of course, there are infinitely many solutions, and yet this is the sort of the problem statisticians face with many modern datasets, arising in genetics, imaging, finance and many other fields. What's worse, our equations are often corrupted by noisy measurements! In this talk I will introduce a statistical method called the Lasso that has been at the centre of the huge amount of research that has gone into solving these problems.

*Monday 25<sup>th</sup> November, 8:30PM*

### **TMS Call My Bluff**

You?

An annual tradition, held by the TMS, in which a team of freshers test their lying capabilities against a team of other students in a reconstruction of the cult British TV show.

*Monday 2<sup>nd</sup> December, 8:30PM*

### **Some elements of algebraic geometry**

Professor Caucher Birkar (DPMMS)

Algebraic geometry occupies a central place in modern mathematics. It has deep connections with various parts of mathematics. It is also deeply related to mathematical physics and has found applications in a wide range of topics. In this talk I will introduce some basics of algebraic geometry and then discuss some applications.