ARE YOU IN YEAR 9 – 10

DO YOU FIND MATHEMATICS INTERESTING?

- So do we !!
- Attendance is free
- All sessions are online via Zoom
- Come to one session or come to them all

CHECK OUT THE FASCINATING TOPICS THAT ARE ON OFFER

If you are interested please contact

Ian Renner at Ian.Renner@newcastle.edu.au

to register and receive your zoom link

TOPICS

Dr Michael Assis—Member of Priority Research Centre CARMA
Date: Wednesday 11 November 2020
Time: 5-6pm
Title: Mathematics of Origami
Abstract: How much mathematics can you learn by just staring at paper? Well, if you begin to fold it, it turns out quite a lot! We will explore together some interesting maths by playing, I mean, folding paper.

Dr Elena Levchenko—Senior Lecturer in Mathematics
Date: Wednesday 18 November 2020
Time: 5-6pm
Title: Mathematics inside materials science
Abstract: Do you want to design new material for a particular application in the future? How can we control the material's properties and behaviour under different conditions? Materials science is the answer. Materials science is truly interdisciplinary involving knowledge of physics, chemistry, engineering and mathematics. Materials science studies the structure of materials across several length scales, with particular focus on *structure-property correlation*. Knowing this correlation and applying a bottom-up approach with mathematical knowledge and computer software is a powerful tool to design innovative nanomaterials for tailored applications. Since structure is one of the most important components of the field of materials science, in this workshop, we will be focusing on it. In particular, we will calculate the packing coefficients of various crystalline structures as well as the number of pentagons in the carbon buckyball structure.

Mr Aron Eastley—PhD Candidate & Casual Academic, Statistics Discipline
Date: Wednesday 25 November 2020
Time: 5-6pm
Title: Statistics is more than just its mean
Abstract: Ever wonder how we can determine the age of the universe? Ever wondered how we can detect and determine other worlds around stars, and whether they are Earth like planets? Mathematics and Statistics allow information, patterns, and knowledge to be extracted from just raw measurements. In this workshop, building and fitting models to a raw data set will be applied, where together through Google Sheets, we will derive a statistical model to explain the relationship between galaxies and their velocities, allowing the age of the universe to be found. As well as this, we will work with some raw measurements of a star's light intensity measured directly from TESS (Transiting Exoplanet Survey Satellite) to determine whether a planet is present. From here, we will derive and calculate the planet's radius, mass, volume, period, and distance from its star, to determine whether the planet is classified as an Earth-like planet or a Super-hot Jupiter class planet.

Professor George Willis—Australian Research Council Laureate Professor in Mathematics
Date: Wednesday 2 December 2020
Time: 5-6pm
Title: The mathematics of symmetry
Abstract: Symmetry may be seen all around us and is also present in ways that we don't see. Mathematics can account for the symmetry of an object or structure in much the same way as numbers measure size. This workshop will highlight some occurrences of symmetry and explain how mathematicians deal with it.

Dr Robert King—Senior Lecturer in Statistics
Date: Wednesday 9 December 2020
Time: 5-6pm
Title: How does a soccer-playing robot know where it is?
Abstract: The NUBots are the University of Newcastle's robot soccer team. They play in the Robocup World Championship. The robots need to know where they are on the field, and where the ball is. This talk (with some activities for you to do) looks at how they identify their position, and how they identify how sure they are about it.