UQ Summer or Winter Research Project Description

Please use this template to create a description of each research project, eligibility requirements and expected deliverables. Project details can then be uploaded to each faculty, school, institute, and centre webpage prior to the launch of the program.

Project title:	Random simplicial complexes and applications.
Hours of engagement & delivery mode	*30pw*, between 24 June to 19 July 2024 Preferred on site, other arrangements possible if requested
Description:	The aim of this project is to investigate models and properties of random simplicial complexes. Simplicial complexes provide a combinatorial model for topological spaces, and are ubiquitous in many areas of mathematics, including topology, geometry and combinatorics. In the past few decades, thanks to the emergence of Topological Data Analysis, simplicial complexes have become a key tool in applied mathematics, used across scientific disciplines. In these context, random simplicial complexes are typically used as null models reproducing properties of interest. This project will explore models for random simplicial complexes, with a focus on applications.
Expected learning outcomes and deliverables:	Expected outcome include a deep understanding of the concepts of simplicial complexes, their simplicial homology, and a good understanding of how these concepts are useful in applications (e.g. topological data analysis). Depending on students' interest, outcomes might include implementation of software.
Suitable for:	(MATH2400 or MATH2401) + (MATH1052 or MATH1072) recommended
Primary Supervisor:	Agnese Barbensi
Further info:	I am happy to meet/chat prior to submitting an application. My email is: a.barbensi@uq.edu.au My office is: B69 floor 7, number 722