Hamilton Walk 2026

Fiacre Ó Cairbre

On Friday, October 16, the staff and students of the Department of Mathematics and Statistics at Maynooth University and members of the general public will take to the banks of the Royal Canal to mark a famous day in the history of mathematics. On this day in 1843, William Rowan Hamilton, one of the most outstanding mathematicians ever, created a strange new number system called quaternions in a flash of inspiration while walking along the banks of the Royal Canal in Dublin.

Each year the Department of Mathematics and Statistics commemorates the event by retracing Hamilton's steps. The walk begins at Dunsink Observatory and heads south to meet the Royal Canal before going east along the canal to end up at Broombridge in Cabra, where a plaque marks the area where Hamilton scratched his formula for the quaternions on the bridge. The walk is about three miles long and passes through some pleasant countryside.

A quaternion is a certain type of four–dimensional number and was a totally new concept in mathematics. Quaternions played an important role in some major breakthroughs in science. For example, they were fundamental in Maxwell's formulation of his theory of electromagnetic waves in 1864. This theory predicted the existence of electromagetic waves and Hertz would follow Maxwell's prediction and detect radio waves in 1887. Maxwell's theory ultimately led to the invention of the first wireless telegraph by Marconi in 1895 and then radio, television and radar all followed. Many things in our society are a consequence of Maxwell's prediction and so these are all linked to quaternions. Also, vector analysis, which is indispensable in Physics, is an offspring of quaternions. Nowadays, quaternions are also important in space navigation (for example the Curiosity landing on Mars in 2012), computer animation, designing computer games and special effects in movies. For example, quaternions were used to create the famous character, Lara Croft, in the computer game Tomb Raider and also some of the special effects in many famous movies including The Matrix Reloaded.

Hamilton has been called the Liberator of Algebra because his quaternions shattered the previously accepted convention that a useful algebraic number system should satisfy the rules of ordinary numbers in arithmetic. The mathematical world was shocked by his audacity in creating a system of numbers that didn't satisfy the usual commutative rule for multiplication (this is the rule which says it doesn't matter in which order you multiply two ordinary numbers, i.e. two times three equals three times two. The quaternions didn't satisfy this rule). Hamilton performed a piece of graffiti by scratching his quaternion formula on the canal bridge. In this act of mathematical vandalism, Hamilton's quaternions opened up a whole new mathematical landscape in which mathematicians were now free to conceive new algebraic number systems that were not shackled by the rules of ordinary numbers. Thus, one can say that modern algebra was born on October 16, 1843, on the

banks of the Royal Canal in Dublin. One could also say, One small scratch for a man, one giant leap for mathematics!

William Rowan Hamilton (1805–1865) is Ireland's greatest mathematician. He was born in Dominick St. in Dublin and spent his youth on the banks of the River Boyne in Trim. Hamilton was appointed Professor in 1827 while still an undergraduate at Trinity College and lived at Dunsink Observatory for the rest of his life.

Booking for the walk is essential with Fiacre Ó Cairbre at fiacre.ocairbre@mu.ie