Tim Hosgood

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Education

2016 – **Université d'Aix-Marseille**	**Doctorat (en Mathématiques)** under Julien Grivaux and Damien Calaque.
2012 – 2016 **University of Oxford**	**MMath (Masters in Mathematics)** First class honours.
2006 – 2012 **Kingsley School, Bideford**	**A-Levels, GCSEs** Maths, Further Maths, Music (A*), French, Spanish (A)

Current research

Defining Chern classes in Hodge and Deligne (i.e. holomorphic) cohomology for coherent sheaves on paracompact complex-analytic manifolds using twisting cochains and simplicial methods. Following on from work by Brylinski and McLaughlin; Grivaux; O'Brian, Toledo, and Tong; and Green.

Papers

arxiv.org/abs/1604.02441

An introduction to varieties in weighted projective space
Weighted projective space arises when we consider the usual geometric definition for projective space and allow for non-trivial weights. Using the Riemann-Roch theorem to calculate $\ell(E, nD)$ where E is a non-singular cubic curve inside $\mathbb{P}^2$ and $D = p \in E$ is a point we obtain a non-negatively graded ring $R(E)$ by taking the direct sum of the $\mathcal{L}(E, nD)$ for $n \geqslant 0$. This gives rise to an embedding of E inside the weighted projective space $\mathbb{P}(1, 2, 3)$. The main result of this paper is a reasonably simple degree-genus formula for non-singular 'sufficiently general' plane curves, proved using not much more than the Riemann-Hurwitz formula.

arxiv.org/abs/1609.00920

Death and extended persistence in computational algebraic topology
The main aim of this paper is to explore the ideas of persistent homology and extended persistent homology, and their stability theorems, using ideas from [Bubenik and Scott, 2014; Cohen-Steiner, Edelsbrunner, and Harer, 2007; and Cohen-Steiner, Edelsbrunner, and Harer, 2009], as well as other sources. The secondary aim is to explore the homology (and cohomology) of non-orientable surfaces, using the Klein bottle as an example. We also use the Klein bottle as an example for the computation of (extended) persistent homology, referring to it throughout the paper.

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Under Spec $\mathbb{Z}$ **– a reader's companion**
Master's dissertation. The aim of this paper was to translate the first few sections (dealing with establishing the formalities of the subject) of [Toën and Vaquié, 2005] into English; to provide ample editorial commentary concerning the translation and historical context; and to comment on the mathematics in the apper, providing enough background information for the new reader to be able to follow the main ideas. The main emphasis is placed on this last point.