

Robert J.S. McDonald - Thesis Abstract  
Department of Mathematics, University of Connecticut, U-1009  
341 Mansfield Road, Storrs, CT 06269-1009, USA  
1-(860)-608-3329 | [robert.j.mcdonald@uconn.edu](mailto:robert.j.mcdonald@uconn.edu)  
<https://mathrjism.com>

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**Thesis Title:** Torsion Subgroups of Elliptic Curves over Function Fields

*Abstract: Let  $k = \mathbb{F}_q$  be a finite field of characteristic  $p$ , and  $C$  be a smooth, projective, absolutely irreducible curve over  $k$ . Let  $K = k(C)$ , and  $E$  be a non-isotrivial elliptic curve over  $K$ . Then,  $E(K)$  is a finitely generated abelian group, and there is a finite list of possible torsion subgroups which can appear that depends only on  $C$  and  $p$ . When the genus of  $C$  is zero and  $p \neq 2, 3$ , a minimal list of prime-to- $p$  torsion subgroups has been determined by Cox and Parry. In this thesis, we extend this result to one for all primes  $p$ , and present an analogue for genus 1 base curves. Additionally, we will determine the complete list of full torsion subgroups possible for a non-isotrivial  $E/K$  when the genus of  $C$  is 0 or 1, and discuss preliminary results for when  $C$  is a hyper-elliptic curve.*