



I am **Andrew Lewis**, a Professor in the Department of Mathematics and Statistics at Queen's University.

My research interests include topics in **differential geometry**, **functional analysis**, and **differential equations**. In the past, my interests included applications to control theory and mechanics, and I still have occasional interest in theoretical problems in these areas.

I am neither smart enough nor organised enough to have nicely packaged research problems. Instead I say some **Things**.

**Thing 1.** I am interested in function space methods involving multiple sorts of "smoothness," e.g., finitely differentiable, infinitely differentiable, complex or real analytic. I am also interested in methods where nondifferentiable regularity arises, e.g., locally Lipschitz, absolutely continuous, Sobolev-style regularity, etc. Problems of regularity of operations on or between function spaces are of particular interest to me. Work in this area (and those of the other two **Things**) involves function analytic techniques beyond classical Banach and Hilbert spaces.

**Thing 3.** A more recent **Thing** in which I have become interested is infinite-dimensional geometry, which combines my existing interests in differential geometry and functional analysis. Here one is interested in understanding what can be done, and when, when working with manifolds whose model space is infinite-dimensional. The infinite-dimensionality introduces subtleties that do not arise in finite-dimensional differential geometry.

**Thing 2.** A particular area where I have made use of the function space methods in my previous **Things** is connected to problems in differential equations, both ordinary and partial. For ordinary differential equations, I am interested in such equations in infinite-dimensional spaces where one can prove useful existence and uniqueness theorems. For partial differential equations, I am interested in such evolution equations as admit a useful representation as an ordinary differential equation in infinite dimensions.

If you find any of these **Things** interesting or would like to hear more about my research, do not hesitate to contact me at [andrew.lewis@queensu.ca](mailto:andrew.lewis@queensu.ca)