# RESEARCH STATEMENT

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My general area of interest is hypercomputation. Within this area I study ordinal time Turing computation. OTTM's admit several reducibility notions. I am interested in studying these and comparing them to established infinitrary reducibilities (in particular $\alpha$-recursion).

Ordinal time Turing computation also has strong links with constructibility. I am looking at the constructible universe afresh with the aid of these machines and the induced reducibility notions.

There is also a substantial question as to what languages are accepted by OTTMs. Generalisations of the lost melody theorem become significant here. I conjecture that sharps are lost melodies for the OTTMs.

In addition to ordinal time Turing computation I have formulated some slight extensions of OTTMs which are capable of computing sharps and various mice. Introducing a notion of strong computability I am interested in what axioms the universe of strongly computable sets is closed under (starting with replacement and power set).

I am investigating these extensions further with a view to proving that they allow the computation of inner models of measurability and possibly other inner models of large cardinals. I would like to find a characterisation of those sets computatable by these extensions. I would also like to characterise which axioms that hold in V will reflect down (in a strong sense) to the universe of strongly computable sets.