

FROM THE TWISTING SOMERSAULT TO THE 3-BODY PROBLEM

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This talk will follow Richard's footsteps in describing recent research on the geometric phase in the twisting somersault (joint work with William Tong) and the (absence of) geometric phase in relative periodic orbits of the regularised equal mass 3-body problem at zero angular momentum (joint work with Danya Rose). In the first problem I will describe how a twisting somersault can be achieved with the motion of a single arm only. This is a problem in non-rigid body dynamics, and requires an extension of Montgomery's formula due to Cabrera. In the second problem I will describe how certain properties of the discrete symmetry group of a periodic orbit lead to the vanishing of its geometric phase, and hence render the relative periodic orbit an absolute periodic orbit. This will be illustrated with many (new) examples of periodic orbits.