HANS BODEN, McMaster University
Casson's invariant and spliced sums

The $\mathrm{SU}(2)$ Casson invariant $\lambda_{\mathrm{SU}(2)}$ is additive under connected sum and more generally under spliced sum. Although the $\mathrm{SU}(3)$ Casson invariant $\lambda_{\mathrm{SU}(3)}$ is not additive under connected sum, additivity can be achieved by subtracting a suitable multiple of $\lambda_{\mathrm{SU}(2)}^2$. It would be natural to expect this same linear combination of $\lambda_{\mathrm{SU}(3)}$ and $\lambda_{\mathrm{SU}(2)}^2$ to be additive for spliced sums, but simple examples show this is not the case. This talk will report on joint work with Ben Himpel on computations of $\lambda_{\mathrm{SU}(3)}$ for spliced sums of torus knots. A key step is to establish a splitting formula for the spectral flow of the odd signature operator. This approach has been applied to give a formula for $\lambda_{\mathrm{SU}(3)}$ for spliced sums along $(2, p)$ and $(2, q)$ torus knots. To handle splicings along other torus knots requires another key step, namely using perturbations to resolve singularities in the moduli space.

This is the subject of ongoing work with Chris Herald and Ben Himpel.