

Frohlich Prize: citation for Richard Thomas

Short citation:

Professor Richard Thomas of Imperial College London is awarded the Fröhlich Prize for his extraordinary mastery and vision in creating and developing what has become known as Donaldson–Thomas theory.

Long version:

Professor Richard Thomas of Imperial College London is awarded the Fröhlich Prize for his extraordinary mastery and vision in creating and developing what has become known as Donaldson–Thomas (DT) theory.

Originally conceived as a way to count holomorphic bundles on Calabi–Yau and Fano complex threefolds, DT theory grew to encompass a stunningly broad spectrum of enumerative problems in algebraic geometry and other branches of mathematics, as well as various refinements of purely numerical counts. Richard Thomas' work provided both the foundation as well as many of the subsequent floors of this impressive building. At the beginning, it was Richard Thomas' construction of the virtual fundamental class for enumeration of bundles on algebraic threefolds that made the DT theory a mathematical theory. Among his many further contributions to the subject is his joint work with Rahul Pandharipande that brought the tools of stable pairs to enumeration of curves in algebraic threefolds in the DT theory context. The great technical power and versatility of this Pandharipande–Thomas (PT) theory made it a tool of choice for most curve-counting problems, both practical and theoretical. In particular, the recent joint work of Feyzbakhsh and Thomas relates the counting problems for bundles and more general sheaves of higher rank to rank one counts handled by PT theory. To complement his work on defining and relating various counts, Richard Thomas greatly advanced the subject by actually doing many highly ingenious computations, as exemplified by his proof with Rahul Pandharipande of the Katz–Klemm–Vafa conjecture for curve counts in K3 surfaces.