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Pulling self-avoiding walks from a surface

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About the speaker:

2006-08 Council Member, Australian Academy of Science
2005   Lyle Medal of the Australian Academy of Science
2004   B. H. Neumann Award for Services to Education
2002   Academician of Australian Academy of Science
2003-   Director, Centre for Mathematics and Statistics of
              Complex Systems, an ARC Centre of Excellence
1999   Hannan Medal of the Australian Academy of Science
1988-   Professor of Mathematics (Personal Chair),
              The University of Melbourne
1987-88   Reader in Mathematics, The University of Melbourne
1984-87   Professor of Mathematics, University of Newcastle

Abstract:

In recent years a mixture of analytic and probabilistic techniques have been used to prove previously conjectured values of the critical point of self-avoiding walks (SAWs) in the bulk and self-avoiding walks attracted to a surface, in both cases on the hexagonal lattice. We now consider the more general problem of SAWs originating in and attracted to a surface of the square lattice, but with their end-point vertex pulled away from the surface, in a direction normal to the surface. This models a number of important experiments on DNA and other bio-polymers. A number of results can be proved analytically, and careful numerical work based on new and more efficient enumeration algorithms allows the phase diagram to be constructed very accurately.

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