

## **Geometric approaches to Dehn surgery**

Marc Lackenby, University of Oxford

Abstract: I will give a survey of the use of hyperbolic geometry in the analysis of Dehn surgery. The main areas that I will discuss are: Thurston's hyperbolic Dehn surgery theorem; the Gromov-Thurston  $2\pi$ -theorem; the 6-theorem by myself and Ian Agol; the relationship between volume and Dehn surgery. My eventual goal is to explain some of the ideas behind my proof with Rob Meyerhoff that a 1-cusped hyperbolic 3-manifold has at most 10 exceptional surgery slopes, which relied on these geometric methods as well as a rigorous computer-assisted analysis of the cusp geometry of hyperbolic 3-manifolds.