

---

**ANTOINE DEZA**, McMaster University

*Combinatorial, computational, and geometric approaches to the colourful simplicial depth*

The colourful simplicial depth conjecture states that any point in the convex hull of each of  $d + 1$  sets, or colours, of  $d + 1$  points in general position in dimension  $d$  is contained in at least  $d^2 + 1$  simplices with one vertex from each set. We verify the conjecture in dimension 4 and provide a new lower bound in higher dimensions improving earlier results of Bárány and Matoušek (2007), Stephen and Thomas (2008), and Deza, Stephen, and Xie (2011). Based on a joint work with Frédéric Meunier (ENPC Paris) and Pauline Sarrabezolles (ENPC Paris).