

**Oberseminar Theoretische Informatik**  
Sommersemester 2008

Frances Rosamond

## **The Parameterized Complexity of the Clique Partition Problem**

Monday, June 2 at 2pm (c.t.) in room 3319 (Ernst-Abbe-Platz 2, floor 3).

The problem of deciding whether the edge-set of a given graph can be partitioned into at most  $k$  cliques is well known to be NP-complete. The key difference between the general CLIQUE COVER problem and our problem, CLIQUE PARTITION, is whether the cliques share edges or not. In this presentation we investigate CLIQUE PARTITION from the point of view of parameterized complexity. We show that this problem is fixed parameter tractable if we choose the number of cliques as parameter. In particular, we show that in polynomial time, a kernel bounded by  $k^2$  can be obtained, where  $k$  is the number of cliques. We also give an  $O(2^{((k+3)\log(k))/2} \cdot n)$  algorithm for this problem in  $K_4$ -free graphs.

Frances Rosamond is visiting from the Parameterized Complexity Research Unit (PCRU) of The University of Newcastle, Australia. After completing her Ph.D. at Cornell University, she founded the Department of Mathematics and Natural Sciences at National University in San Diego, where she remained Department Chair and Professor until moving to Victoria University, Wellington, New Zealand. She then joined the Department of Multimedia and Design and the Department of Electrical Engineering and Computer Science at The University of Newcastle, before moving to her current position in the PCRU in 2007. Dr. Rosamond is Editor of the Parameterized Complexity Newsletter and past Associate Editor for the Journal of Humanistic Mathematics.

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