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Maria Chudnovsky and **Paul Seymour*** (pds@math.princeton.edu), Math Dept, Princeton University, Fine Hall, Washington Rd, Princeton, NJ 08544. *Perfect matchings in planar cubic graphs*. Preliminary report.

A well-known conjecture of Lovasz asserts that for every 2-edge-connected cubic graph G with n vertices, the number of perfect matchings in G is exponential in n . This seems to be wide open still, and as far as we know the best lower bound is $n/2$.

In this talk we sketch a proof of Lovasz' conjecture for PLANAR cubic graphs. In this case the problem is more tractable, because we can use the four-colour theorem as a source of 3-edge-colourings and hence of perfect matchings. (Received January 24, 2008)