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Conjugated circuits, currents in benzenoids and equiaromaticity

Benzenoids are simple planar 2-connected graphs embedded in the plane with hexagonal internal faces, internal vertices of degree 3 and external vertices of degree 2 or 3. Cycle C in graph G is a conjugated circuit if both G and $G-C$ have perfect matchings. Chemical aromaticity implies that a molecule supports magnetically induced ring currents. Models for these currents are often based on conjugated-circuit contributions. We identify *equiaromatic* benzenoids, where corresponding rings support equal currents, with implications for molecular properties and connections with Fibonacci and Lucas numbers.

*Joint work with Sam Cotton, Dan Jenkinson, Wendy Myrvold and William Bird