Graph Theory: Lecture No. 25

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Can you think of some non-perfect graphs ?

- **Odd cycles of length at least 5. (Odd holes)**
- **Their complements. (Odd anti-holes.)**

Berge's Strong Perfect Graph Conjecture (1964): A graph is perfect if and only if it has no induced hole or anti-hole.

Chudnovsky, Robertson, Seymour, Thomas, 2002: A Graph G is perfect if and only if neither G nor $\overline{G}$ contains an odd cycle of length at least 5 as an induced subgraph

A graph is perfect if and only if its complement is perfect

Any graph obtained from a perfect graph by expanding a vertex is again perfect

A graph G is perfect if and only if for every induced subgraph H of G, $|H| \leq \omega(H)\alpha(H)$.