

# FORBIDDEN INDUCED SUBGRAPHS AND COLOURINGS

INGO SCHIERMEYER  
FREIBERG

5th WORKSHOP ON THE  
MATTHEWS-SUMNER CONJECTURE



## TYPE OF THEOREM:

IF  $G$  IS  $(F_1, F_2, \dots)$ -FREE, THEN  $\chi(G) \leq k$

EXAMPLES:  $(K_3, P_5)$  3

$(K_3, P_6)$  4

$(K_3, \text{C}_5)$  3

$(K_3, \text{C}_6)$  4

## DESIRED THEOREM:

IF  $G$  IS  $(F_1, F_2, \dots)$ -FREE, THEN  $\chi(G^2) \leq k$

KNOWN:  $\chi(G) \leq \Delta + 1$

$\chi(G^2) \leq \Delta^2 + 1$

## • PLANAR GRAPHS

WEGNERS CONJECTURE '77

$$\chi(G^2) \leq \lceil \frac{3}{2} \Delta \rceil + 1 \text{ FOR } \Delta \geq 8$$

$$= 7 \text{ FOR } \Delta = 3$$

$$= \Delta + 5 \text{ FOR } 4 \leq \Delta \leq 7$$

## • QUESTION:

IF  $G$  IS  $(F_1, F_2, \dots)$ -FREE

THEN  $G^2$  IS  $(H_1, H_2, \dots)$ -FREE