

# Many $T$ copies in $H$ -free graphs

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## Abstract

For two graphs  $T$  and  $H$  and for an integer  $n$ , let  $ex(n, T, H)$  denote the maximum possible number of copies of  $T$  in an  $H$ -free graph on  $n$  vertices. The study of this function when  $T = K_2$  (a single edge) is the main subject of extremal graph theory. We investigate the general function, focusing on the cases of triangles, complete graphs and trees.

In this talk the main results will be presented as will sketches of proofs of some of the following results:

1.  $ex(n, K_3, C_5) \leq (1 + o(1))(\sqrt{3})/2n^{3/2}$ .
2. For any fixed integer  $m, s > 2m - 3$  and  $t > (s - 1)!$ ,

$$ex(n, K_m, K_{s,t}) = \Theta(n^{m-m(m-1)/2s})$$

and,

3. For any two trees  $H$  and  $T$  there are two constants  $c_1$  and  $c_2$  for which one has

$$c_1 n^m < ex(n, T, H) < c_2 n^m$$

where  $m = m(T, H)$  is an integer depending on  $H$  and  $T$  (its precise definition is given in the talk).

The first statement improves (slightly) a result of Bollobás and Győri.

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