## CMS/CS/EE 144

Networks: Structure & Economics

### Administrivia

- HW1 is due now.
  - -- Turn it in to Moodle
  - -- Pick up solutions now (or later from my office)
- 2) HW2 is out. Start early!
- 3) Continue working on blog posts...
- Interesting lunch bunch after class next Tuesday (Crytptocurrencies)...
- 5) Adam's office hours

### So far:

Four "universal" properties of networks

- 1) A "giant" connected component
- 2) Small diameter
- 3) Heavy-tailed degree distribution
- 4) High clustering coefficient

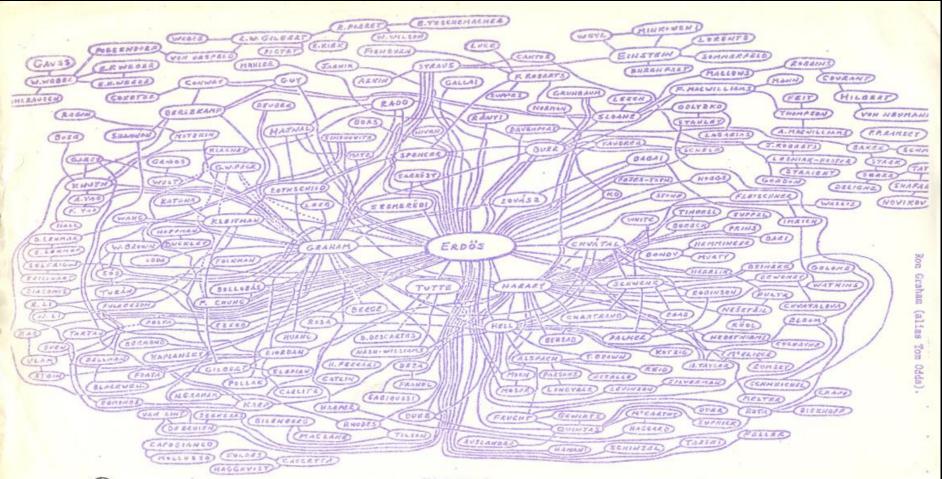
# We're trying to understand:

Why are these properties "universal"?

# Lecture 3:

Why is there a giant component?





To appear in Topics in Graph Theory (F. Harary, ed.) New York Academy of Sciences (1979).



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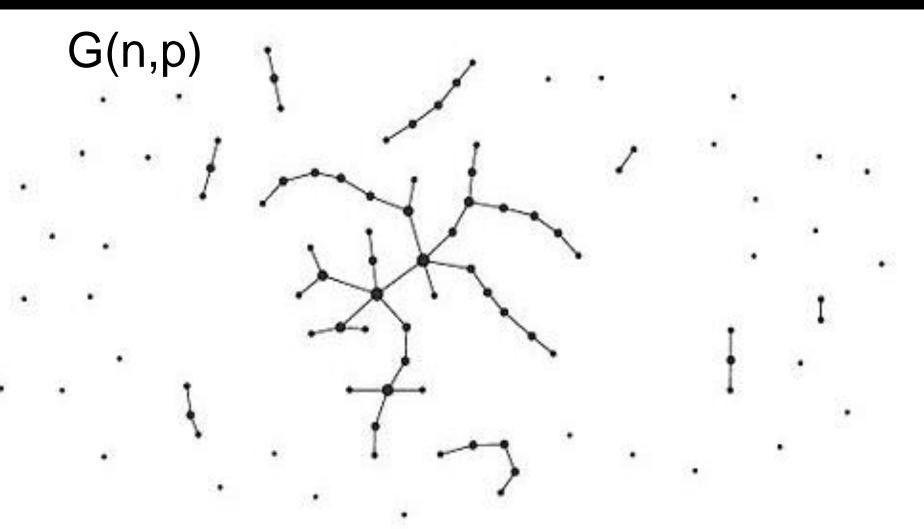
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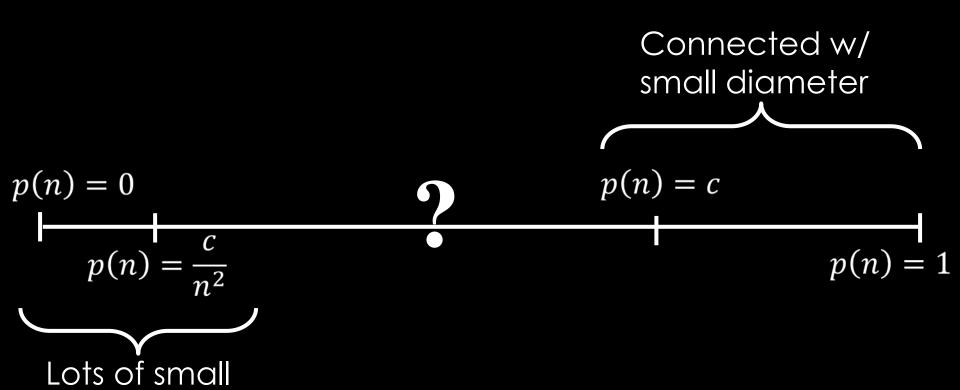
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$$p(n) = 0$$

$$p(n)=1$$



components

$$p(n) = 0 p(n) = \frac{c}{n} p(n) = c$$

$$p(n) = \frac{c}{n^2} p(n) = \frac{\log n}{n} p(n) = 1$$