Erdős-Rényi **ER** [1959]	Random graph with N vertices and p — probability of having adjacency
	Poisson's model: $\Pr\{\deg(v) = i\} = \frac{\lambda^i e^{-\lambda}}{i!}$, $\lambda = (N-1)p$ (average node number)
Milgram [1967]	Small worlds
Watts-Strogatz **WS** [1998]	Algorithm for creation of small worlds
Sieci bezskalowe	Power law: $\Pr\{\deg(v) = i\} = Ci^{-\gamma}$
	Heavy tail (it is possible that variance or even mean is infinite)
Albert-Barabási **AB** [1999]	Scale-free networks created with the so-called preferential attachment

Random networks (ER)	**Scale-free networks (AB)**	**Small worlds (WS)**
Power (energy) network	Hyperlinks (WWW) [Barabási]	Power (energy) network
Highways in US	Physical connections in the Internet [Faloutsos]	WWW
	Connections between e-mail users	Neural network in a brain
	Social networks (Twitter, Facebook)	
	Air-connections between cities	
	Sexual contacts [research in Sweden]	
	Business cooperation	
	Citations of scientific papers	
	Actors featuring in the same movie	
	Bio-chemical reactions in metabolic networks	

Prop.	**Random networks (ER)**	**Scale-free networks (AB)**	**Small worlds (WS)**	**Real networks**
Small diameter	Yes	Yes	Yes	Yes
Local cluste-ring	No	Yes	Yes	Yes
Heavy-tailed *deg*	No	Yes	No	Yes

Centrality based on:

Adjacency	$\boldsymbol{A\pi} = \lambda_1 \boldsymbol{\pi}$
Distance	$\frac{N-1}{\sum_{k \neq i} dist(v_i, v_k)}$
Betweenness	For a node i: $\frac{2}{(N-1)(N-2)} \sum_{n \neq i} \sum_{m>n, m \neq i} \frac{\delta_{nm}^{(i)}}{\delta_{nm}}$ (n, m: nodes)
	For a link e: $\frac{2}{N(N-1)} \sum_n \sum_{m>n} \frac{\delta_{nm}^{(e)}}{\delta_{nm}}$