Marin Mersenne (1588-1648)

A Mersenne prime is a prime of the form

$$M_n = 2^n - 1.$$

Mersenne in the preface of his book *Cogitata Physica-Mathematica* (1644), claimed that for $n \leq 257$, M_n is prime if and only if n belongs to the following list

$$2,\ 3,\ 5,\ 7,\ 13,\ 17,\ 19,\ 31,\ 67,\ 127,\ \text{and } 257.$$

$M_3 = 7$, $M_5 = 31$, $M_7 = 127$, $M_{13} = 8191$, $M_{17} = 131071$,
$M_{19} = 524287$
$M_{31} = 2147483647$
$M_{67} = 147573952589676412927$
$M_{127} = 170141183460469231731687303715884105727$
$M_{257} = 231584178474632390847141970017375815706539969331281128078915168015826259279871$

How many Mersenne primes do we know?

As of today we know 50 Mersenne prime:

$n.$	2^{p-1}	digits	Discover by	year
9	$2^{61}-1$	19	Pervushin	1883
10	$2^{89}-1$	27	Powers	1911
11	$2^{107}-1$	33	Powers & Fauquemberge	1914
12	$2^{127}-1$	39	Lucas	1876
13	$2^{521}-1$	157	Lehmer & Robinson	1952
14	$2^{607}-1$	187	Lehmer & Robinson	1952
15	$2^{1279}-1$	386	Lehmer & Robinson	1952
16	$2^{2203}-1$	664	Lehmer & Robinson	1952
17	$2^{2281}-1$	687	Lehmer & Robinson	1952
18	$2^{3217}-1$	969	Riesel	1957
19	$2^{4253}-1$	1,281	Hurwitz & Selfridge	1961
20	$2^{4423}-1$	1,332	Hurwitz & Selfridge	1961
21	$2^{9689}-1$	2,917	Gillies	1963
22	$2^{9941}-1$	2,993	Gillies	1963
23	$2^{11213}-1$	3,376	Gillies	1963

How many Mersenne primes do we know?

$n.$	2^{p-1}	digits	Discover by	year
24	$2^{19937}-1$	6,002	Tuckerman	1971
25	$2^{21701}-1$	6,533	Noll & Nickel	1978
26	$2^{23209}-1$	6,987	Noll	1979
27	$2^{44497}-1$	13,395	Nelson & Slowinski	1979
28	$2^{86243}-1$	25,962	Slowinski	1982
29	$2^{110503}-1$	33,265	Colquitt & Welsh	1988
30	$2^{132049}-1$	39,751	Slowinski	1983
31	$2^{216091}-1$	65,050	Slowinski	1985
32	$2^{756839}-1$	227,832	Slowinski & Gage	1992
33	$2^{859433}-1$	258,716	Slowinski & Gage	1994
34	$2^{1257787}-1$	378,632	Slowinski & Gage	1996
35	$2^{1398269}-1$	420,921	GIMPS / Armengaud	1996
36	$2^{26972593}-1$	895,932	GIMPS / Spence	1997
37	$2^{3021377}-1$	909,526	GIMPS / Clarkson	1998
38	$2^{6972593}-1$	2,098,960	GIMPS / Hajratwala	1999

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$n.$	2^{p-1}	digits	Discover by	year
39	$2^{13466917}-1$	4,053,946	GIMPS /Cameron	2001
40	$2^{20996011}-1$	6,320,430	GIMPS / Shafer	2003
41	$2^{24036583}-1$	7,235,733	GIMPS /Findley	2004
42	$2^{25964951}-1$	7,816,230	GIMPS / Nowak	2005
43	$2^{30402457}-1$	9,152,052	GIMPS /Cooper & Boone	2005
44	$2^{32582657}-1$	9,808,358	GIMPS / Cooper & Boone	2006
45	$2^{37156667}-1$	11,185,272	GIMPS /Elvenich	2008
46	$2^{42643801}-1$	12,837,064	GIMPS /Strindmo	2009
47	$2^{43112609}-1$	12,978,189	GIMPS / Smith	2008
48	$2^{57885161}-1$	17,425,170	GIMPS / Curtis Cooper	2013
49*	$2^{74207281}-1$	22,338,618	GIMPS / Curtis Cooper	2013
50*	$2^{77232917}-1$	23,249,425	GIMPS / Jon Pace	2017
51*	$2^{82589933}-1$	24,862,048	GIMPS / Patrick Laroche	2018