

Knowledge is not exploding but increasing linearly over time

Supplementary Information

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Table 1: Mathematical conjectures since 1960, sorted by priority date.

Priority date	Conjecture date	Proved by	Former name
1962	1902	Walter Feit, and John G. Thompson	Burnside conjecture
1968	1890	Gerhard Ringel, and John W. T. Youngs	Heawood conjecture
1971	1963	Daniel Quillen	Adams conjecture
1973	1949	Pierre Deligne	Weil conjectures
1975	1968	Henryk Hecht, and Wilfried Schmid	Blattner's conjecture
1975	1965	William Haboush	Mumford conjecture
1975	1973	Václav Chvátal	Art Gallery Problem
1975	1936	Paul Erdős, and Paul Turán	Szemerédi's theorem
1976	1955	Daniel Quillen, and independently by Andrei Suslin	Serre's conjecture
1976	1852	Kenneth Appel, and Wolfgang Haken	Four color theorem
1977	1909	Alberto Calderón	Denjoy's conjecture
1978	1846	Roger Heath-Brown, and Samuel J. Patterson	Kummer's conjecture
1983	1922	Gerd Faltings	Mordell conjecture
1983	1970	Neil Robertson, and Paul D. Seymour	Wagner's conjecture
1983	1965	Michel Raynaud	Manin-Mumford conjecture
1984	1969	Barry Mazur, and Andrew Wiles	Main conjecture (Iwasawa theory)
1984	1972	Haynes Miller	Sullivan conjecture
1984	1949	John Morgan, and Hyman Bass	Smith conjecture
1984	1916	Louis de Branges de Bourcia	Bieberbach conjecture
1984	1975	Gunnar Carlsson	Segal's conjecture
1987	1929	Grigory Margulis	Oppenheim conjecture
1989	1959	Vladimir I. Chernousov	Weil's conjecture
1990	1987	Ken Ribet	Epsilon conjecture
1992	1979	Richard Borcherds	Conway-Norton conjecture
1992	1978	Charles P. Boyer, Jacques C. Hurtubise, and Benjamin M. Mann et al.	Atiyah-Jones conjecture
1994	1957	David Harbater, and Michel Raynaud	Abhyankar's conjecture
1994	1637	Andrew Wiles	Fermat's Last Theorem
1994	1979	Fred Galvin	Dinitz conjecture
1995	1982	Doron Zeilberger	Alternating sign matrix conjecture
1996	1970	Vladimir Voevodsky	Milnor conjecture
1998	1943	Thomas C. Hales, and Sean McLaughlin	Dodecahedral conjecture
1998	1611	Thomas C. Hales	Kepler conjecture
2000	1989	Krzysztof Kurdyka, Tadeusz Mostowski, and Adam Paruski	Gradient conjecture
2001	1957	Christophe Breuil, Brian Conrad, Fred Diamond, and Richard Taylor	Taniyama-Shimura conjecture
2001	1993	Mark Haiman	$n!$ conjecture
2001	1990	Daniel Frohardt, and Kay Magaard	Guralnick-Thompson conjecture
2002	1844	Preda Mihăilescu	Catalan's conjecture
2002	1961	Maria Chudnovsky, Neil Robertson, Paul D. Seymour, and Robin Thomas	Strong perfect graph conjecture
2002	1904	Grigori Perelman	Poincaré conjecture
2003	1982	Grigori Perelman	Geometrization conjecture
2003	1988	Ben Green, and independently by Alexander Sapozhenko	Cameron-Erdős conjecture
2003	1970	Nils Dencker	Nirenberg-Treves conjecture
2003	1979	Luca Barbieri-Viale, Andreas Rosenschon, and Morihiko Saito	Deligne's conjecture
2004	1972	Ualbai U. Umirbaev, and Ivan P. Shestakov	Nagata's conjecture
2004	1974	Ian Agol, and independently by Danny Calegari-David Gabai	tameness conjecture
2004	1903	Nobuo Iiyori, and Hiroshi Yamaki	Frobenius conjecture
2004	1988	Adam Marcus, and Gábor Tardos	Stanley-Wilf conjecture
2008	1970	Avraham Trahtman	Road coloring conjecture
2008	1975	Chandrashekhara Khare, and Jean-Pierre Wintenberger	Serre's modularity conjecture
2009	1968	Jeremy Kahn, and Vladimir Markovic	surface subgroup conjecture
2009	1984	Jeremie Chalopin, and Daniel Gonçalves	Scheinerman's conjecture
2011	1957	Joel Friedman, and independently by Igor Mineyev	Hanna Neumann conjecture
2012	1970	Simon Brendle	Hsiang-Lawson's conjecture
2012	1965	Fernando C. Marques, and André Neves	Willmore conjecture
2013	1959	Adam Marcus, Daniel Spielman, and Nikhil Srivastava	Kadison-Singer problem
2013	1742	Harald Helfgott	Goldbach's weak conjecture
2015	1935	Jean Bourgain, Ciprian Demeter, and Larry Guth	Main conjecture (Vinogradov's mean-value theorem)
2018	1970	Karim Adiprasito	g -conjecture
2019	1992	Hao Huang	Sensitivity conjecture
2019	1941	Dimitris Koukoulopoulos, and James Maynard	Duffin-Schaeffer conjecture
2021	1978	Alexander Dunn, and Maksym Radziwiłł	Patterson's conjecture

^a Wagner's conjecture is proved in a series of twenty papers spanning over 500 pages from 1983 to 2004. For ease of handling, we use the earliest year 1983.

^b The Segal's conjecture was made in the mid 1970s by Graeme Segal. For ease of handling, we use 1975 to approximate it.

^c The Stanley-Wilf conjecture is formulated independently by Richard P. Stanley and Herbert Wilf in the late 1980s. For ease of handling, we use 1988 to approximate it.

Table 2: Breakpoints in the evolution of KQI across disciplines, sorted in alphabetical order.

Discipline	Breakpoints Year
Accounting	1976.36 (± 0.42), 1994.74 (± 0.43)
Acoustics	1961.51 (± 0.43)
Actuarial science	1973.57 (± 0.52), 1990.74 (± 0.63)
Advertising	1972.21 (± 0.51), 1984.96 (± 0.58), 2000.25 (± 0.36)
Aeronautics	1948.54 (± 0.89)
Aerospace engineering	1951.42 (± 0.57), 1998.69 (± 1.92)
Aesthetics	1966.49 (± 0.55), 1983.72 (± 0.41), 2003.46 (± 0.24)
Agricultural economics	1936.60 (± 3.71), 1963.30 (± 0.58), 1972.23 (± 0.67), 1985.16 (± 2.28), 1999.92 (± 0.37)
Agricultural engineering	1970.52 (± 1.14), 2000.63 (± 0.74), 2013.94 (± 0.30)
Agricultural science	1975.73 (± 0.67), 1997.52 (± 0.29)
Agroforestry	1948.63 (± 0.79), 1960.63 (± 0.97), 1980.17 (± 0.36), 1992.43 (± 0.79), 2001.91 (± 0.31)
Agronomy	1956.73 (± 0.36), 2006.60 (± 0.52)
Algebra	1948.75 (± 0.31), 1965.39 (± 0.18), 1980.42 (± 0.25), 1999.74 (± 0.73)
Algorithm	1959.33 (± 0.33), 1969.43 (± 0.29), 1985.54 (± 0.28), 1995.66 (± 0.19)
Analytical chemistry	1949.43 (± 0.48)
Anatomy	1939.45 (± 0.33), 1962.48 (± 0.18), 1989.33 (± 0.42), 2005.51 (± 0.79)
Ancient history	1958.67 (± 0.31), 1993.64 (± 1.42)
Andrology	1940.47 (± 2.36), 1965.64 (± 0.49), 1977.52 (± 0.36), 2004.65 (± 1.12)
Anesthesia	1963.56 (± 0.28), 1990.48 (± 0.77)
Animal science	1948.85 (± 0.33), 1974.78 (± 0.37), 1988.43 (± 0.70), 2000.46 (± 0.57)
Anthropology	1951.56 (± 0.76), 1972.38 (± 0.70), 1992.84 (± 0.48)
Applied mathematics	1947.49 (± 1.16), 1964.44 (± 0.74), 2012.61 (± 0.28)
Applied psychology	1937.93 (± 1.37), 1969.85 (± 0.46)
Archaeology	1930.72 (± 1.64), 1951.64 (± 0.77), 1963.50 (± 0.33), 1980.52 (± 0.60), 1992.26 (± 0.42), 2002.68 (± 0.22)
Architectural engineering	1966.25 (± 1.27), 1985.47 (± 0.89), 2009.61 (± 0.11)
Arithmetic	1962.39 (± 0.49), 1985.80 (± 0.63), 1998.80 (± 0.41)
Art	1966.54 (± 0.71), 1996.75 (± 0.37)
Art history	1959.53 (± 1.12), 1981.68 (± 0.76), 1997.35 (± 0.32)
Artificial intelligence	1960.78 (± 0.87), 1976.51 (± 0.55)
Astrobiology	1955.58 (± 1.29)
Astronomy	1954.60 (± 0.67), 1965.37 (± 0.24), 1977.32 (± 0.27), 1997.03 (± 0.18)
Astrophysics	1952.53 (± 1.17), 1965.70 (± 0.32), 1976.65 (± 0.43), 1995.64 (± 0.24)
Atmospheric sciences	1947.81 (± 0.25), 1961.57 (± 0.33), 1975.40 (± 0.20), 2006.19 (± 0.50)
Atomic physics	1950.28 (± 0.25), 1973.48 (± 0.51), 1986.63 (± 0.52)
Audiology	1951.43 (± 1.18), 1969.60 (± 0.65)
Automotive engineering	1964.73 (± 0.22), 2000.58 (± 0.36), 2009.40 (± 0.14)
Biochemical engineering	1977.47 (± 0.92), 2000.86 (± 0.58), 2010.58 (± 0.18)
Biochemistry	
Bioinformatics	1994.82 (± 0.26)
Biological system	1972.88 (± 0.54), 2000.42 (± 0.24)
Biology	1963.81 (± 0.89)
Biomedical engineering	1956.43 (± 0.85), 1974.33 (± 0.41), 1993.56 (± 0.38), 2004.87 (± 0.11)
Biophysics	1961.52 (± 0.31), 1987.59 (± 0.70), 2012.72 (± 0.39)
Biotechnology	1971.49 (± 1.77), 1985.99 (± 0.57), 2004.63 (± 0.21)
Botany	1960.54 (± 1.73)
Business	1972.55 (± 0.78), 1991.55 (± 0.44)
Business administration	1989.62 (± 0.59)
Calculus	1960.50 (± 0.85), 1983.11 (± 0.75)
Cancer research	1971.89 (± 0.27), 1993.29 (± 0.17)
Cardiology	1994.58 (± 1.35)
Cartography	1952.48 (± 1.11), 1976.62 (± 0.83), 1998.57 (± 0.21)
Cell biology	1936.47 (± 0.92), 1952.30 (± 0.73), 1957.70 (± 0.36), 1977.69 (± 0.70), 1994.60 (± 0.12), 2007.64 (± 0.26)
Ceramic materials	1956.76 (± 0.89), 2009.67 (± 0.32)
Chemical engineering	1963.73 (± 1.72), 1993.97 (± 0.77), 2004.67 (± 0.36), 2015.00 (± 0.22)
Chemical physics	1950.58 (± 0.82), 1969.60 (± 0.33), 1984.61 (± 0.54), 2001.73 (± 0.22), 2015.00 (± 0.33)
Chemistry	1936.80 (± 1.42), 1957.42 (± 0.22), 1982.32 (± 0.41), 2007.29 (± 0.35)
Chromatography	1945.73 (± 0.14), 1960.64 (± 0.38), 1983.28 (± 0.24), 2007.16 (± 0.51)
Civil engineering	1963.20 (± 0.45), 1997.81 (± 0.39), 2010.56 (± 0.16)
Classical economics	1972.58 (± 0.47)
Classical mechanics	1933.76 (± 0.76), 1957.59 (± 0.22), 1974.53 (± 0.33), 2007.00 (± 1.69)
Classics	1959.33 (± 0.88), 1980.55 (± 0.80), 1995.46 (± 0.55)
Climatology	1932.41 (± 2.77), 1948.74 (± 0.29), 1965.45 (± 0.29), 1977.74 (± 0.46), 1996.64 (± 0.32)

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Discipline	Breakpoints Year
Clinical psychology	1936.67 (± 0.34), 1961.55 (± 0.30), 1975.27 (± 0.25), 1987.49 (± 0.66), 2003.26 (± 0.50)
Cognitive psychology	1954.30 (± 0.85), 1985.54 (± 0.94), 2002.65 (± 0.47)
Cognitive science	1974.61 (± 0.20)
Combinatorial chemistry	1965.45 (± 1.38), 1992.70 (± 0.17)
Combinatorics	1952.12 (± 0.51), 1964.58 (± 0.26), 1988.56 (± 0.39)
Commerce	1975.84 (± 1.81), 1992.17 (± 0.49)
Communication	1962.33 (± 0.20), 1981.74 (± 0.44)
Composite material	1943.64 (± 0.99), 1966.51 (± 0.28), 2009.31 (± 0.25)
Computational biology	1940.00 (± 10.12), 1985.53 (± 1.28), 2000.34 (± 0.43)
Computational chemistry	
Computational physics	1936.29 (± 0.95), 1985.73 (± 0.46), 2004.90 (± 0.30)
Computational science	1965.64 (± 0.90), 1983.61 (± 0.34), 2008.39 (± 0.26)
Computer architecture	1968.61 (± 0.22), 2009.32 (± 0.42)
Computer engineering	1956.58 (± 0.44)
Computer graphics (images)	1977.79 (± 0.70)
Computer hardware	1959.82 (± 0.95)
Computer network	1971.20 (± 0.37), 1984.67 (± 0.93)
Computer science	1965.65 (± 0.31)
Computer security	1977.34 (± 0.77), 1995.56 (± 0.29)
Computer vision	1969.29 (± 0.50), 1980.65 (± 0.35)
Condensed matter physics	
Construction engineering	1962.34 (± 1.63), 1988.54 (± 0.72), 2010.75 (± 0.18)
Control engineering	1966.71 (± 1.12), 1981.71 (± 0.73)
Control theory	1959.75 (± 0.28)
Criminology	1972.48 (± 0.21)
Crystallography	1953.40 (± 0.22), 1975.59 (± 0.34)
Data mining	1972.39 (± 0.44), 1988.50 (± 0.54)
Data science	1981.69 (± 0.91), 1999.64 (± 0.28), 2008.68 (± 0.15)
Database	1971.58 (± 0.14), 1993.63 (± 0.26)
Demographic economics	1968.39 (± 0.52), 1995.72 (± 0.34)
Demography	1964.23 (± 0.35), 1976.63 (± 0.54), 1994.60 (± 0.40)
Dentistry	1948.70 (± 1.35), 1978.29 (± 0.81), 2001.55 (± 1.42)
Dermatology	1980.30 (± 0.41)
Development economics	1956.80 (± 1.07), 1971.75 (± 0.64), 1991.41 (± 0.68)
Developmental psychology	
Discrete mathematics	1950.72 (± 0.56), 1962.46 (± 0.41), 1989.41 (± 0.57)
Distributed computing	1967.71 (± 0.21)
Earth science	1956.55 (± 0.47), 2003.82 (± 0.37)
Ecology	1958.44 (± 0.47)
Econometrics	1935.30 (± 0.48), 1948.71 (± 0.49), 1962.75 (± 0.74), 1985.49 (± 0.72)
Economic geography	1962.15 (± 0.39), 1999.42 (± 0.21)
Economic growth	1968.41 (± 0.49), 1989.51 (± 0.55)
Economic history	1956.54 (± 1.09), 1975.55 (± 1.57), 1999.00 (± 1.13)
Economic policy	1970.51 (± 1.40), 1985.41 (± 0.73)
Economic system	1962.32 (± 0.53), 1977.33 (± 0.43)
Economics	1965.60 (± 0.19), 2007.82 (± 1.09)
Economy	1971.62 (± 0.39), 1994.37 (± 0.68)
Electrical engineering	1950.60 (± 0.33), 1986.54 (± 0.46), 2001.75 (± 0.54)
Electronic engineering	1943.51 (± 0.44), 1965.00 (± 0.67), 1985.89 (± 0.33)
Embedded system	1972.59 (± 0.54), 1993.42 (± 0.19)
Emergency medicine	1937.61 (± 3.42), 1965.75 (± 0.58), 1982.64 (± 0.33), 1996.65 (± 0.16), 2008.51 (± 0.24)
Endocrinology	1937.68 (± 0.31), 1965.23 (± 0.26), 1986.68 (± 1.25)
Engineering	1985.33 (± 0.31), 2005.65 (± 0.26)
Engineering drawing	1963.61 (± 0.82), 1985.36 (± 0.42), 2010.15 (± 0.72)
Engineering ethics	1968.42 (± 0.84), 1990.51 (± 0.39), 2004.39 (± 0.34)
Engineering management	1965.65 (± 0.68), 1987.39 (± 0.66), 1995.81 (± 0.42)
Engineering physics	1963.36 (± 1.93), 2010.32 (± 0.23)
Environmental chemistry	1966.68 (± 0.32), 2012.25 (± 0.84)
Environmental economics	1969.45 (± 0.66), 1994.77 (± 0.46), 2011.61 (± 0.24)
Environmental engineering	1961.55 (± 1.13), 1980.54 (± 0.42), 1999.32 (± 0.24)
Environmental ethics	1979.30 (± 0.97), 2004.50 (± 0.35)
Environmental health	1966.49 (± 0.64), 1983.51 (± 0.29), 1998.26 (± 0.18)

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Discipline	Breakpoints Year
Environmental planning	1971.34 (± 0.52), 1997.37 (± 0.17)
Environmental protection	1955.37 (± 2.40), 1974.52 (± 0.59), 1989.76 (± 0.43), 2004.52 (± 0.21)
Environmental resource management	1972.54 (± 0.59), 1997.50 (± 0.29)
Environmental science	1959.78 (± 0.45), 1976.68 (± 0.69), 1998.68 (± 0.72)
Epistemology	1949.62 (± 0.69), 1966.45 (± 0.23), 1976.49 (± 0.75), 1999.00 (± 0.92)
Ethnology	1967.48 (± 0.64), 1997.81 (± 0.28)
Evolutionary biology	1990.47 (± 0.75)
Family medicine	1932.32 (± 1.85), 1962.59 (± 0.63), 1975.43 (± 0.30), 1986.41 (± 0.34), 1997.40 (± 0.12)
Finance	1967.76 (± 0.44), 1979.61 (± 1.04)
Financial economics	1966.69 (± 0.13), 2004.68 (± 0.48)
Financial system	1969.63 (± 0.87), 1990.36 (± 0.38)
Fishery	1963.41 (± 0.28)
Food science	1931.36 (± 0.40), 1950.31 (± 0.37), 1971.90 (± 0.64), 2004.32 (± 0.14)
Forensic engineering	1945.16 (± 3.16), 1967.35 (± 0.52), 1983.35 (± 0.99), 2006.48 (± 0.26)
Forestry	1961.50 (± 1.97), 1992.20 (± 0.62)
Gastroenterology	1978.29 (± 0.58)
Gender studies	1969.41 (± 0.83), 1986.39 (± 0.37)
Genealogy	1958.57 (± 0.63), 1997.55 (± 0.36)
General surgery	1950.86 (± 2.15), 1991.45 (± 0.69), 2001.58 (± 0.48)
Genetics	1972.68 (± 0.75)
Geochemistry	1949.83 (± 0.41), 1960.94 (± 0.35), 1981.36 (± 0.27), 2010.51 (± 0.81)
Geodesy	1956.42 (± 0.27), 1978.26 (± 0.71), 2011.00 (± 1.37)
Geography	1960.45 (± 0.55), 1997.84 (± 0.30)
Geology	1950.57 (± 0.37), 1961.53 (± 0.25), 1982.71 (± 0.36), 2009.43 (± 1.02)
Geometry	1967.70 (± 0.38)
Geomorphology	1950.52 (± 0.38), 1968.40 (± 0.65), 2006.00 (± 1.15)
Geophysics	1955.18 (± 0.20), 1976.50 (± 0.30)
Geotechnical engineering	1949.68 (± 0.89), 1965.68 (± 0.25), 2009.60 (± 0.18)
Gerontology	1978.67 (± 0.60), 1993.61 (± 0.25)
Gynecology	
History	1959.22 (± 0.99), 1982.35 (± 1.07)
Horticulture	1955.90 (± 1.92), 1976.37 (± 0.73), 2003.65 (± 0.19)
Human-computer interaction	1977.78 (± 0.38)
Humanities	1997.26 (± 0.29)
Hydrology	1938.24 (± 0.72), 1962.76 (± 0.17), 1980.57 (± 0.23), 2004.00 (± 0.57)
Immunology	1965.86 (± 0.20), 1983.49 (± 0.59), 1998.36 (± 0.40)
Industrial engineering	1952.60 (± 2.69), 1974.63 (± 1.00), 1987.42 (± 0.53), 2009.46 (± 0.25)
Industrial organization	1975.20 (± 0.40)
Information retrieval	1966.62 (± 1.63), 1991.77 (± 0.48)
Inorganic chemistry	1939.83 (± 0.59), 1956.73 (± 0.50), 1964.49 (± 0.53), 1979.35 (± 0.99), 2006.49 (± 0.18)
Intensive care medicine	1949.77 (± 1.41), 1981.60 (± 0.30), 1995.74 (± 0.28)
Internal medicine	1939.49 (± 0.38), 1963.31 (± 0.34)
International economics	1968.33 (± 1.34), 1985.70 (± 0.86)
International trade	1972.24 (± 0.60), 1991.63 (± 0.78)
Internet privacy	1987.50 (± 0.98), 2000.65 (± 0.24)
Keynesian economics	1969.63 (± 0.40)
Knowledge management	1970.68 (± 0.80), 1983.35 (± 0.50)
Labour economics	1972.42 (± 0.29)
Law	1971.37 (± 0.76), 1993.46 (± 0.61)
Law and economics	1965.68 (± 0.84), 1983.86 (± 0.85), 1999.27 (± 0.24)
Library science	1979.59 (± 1.00)
Linguistics	1965.43 (± 0.24)
Literature	1959.24 (± 1.23), 1977.47 (± 0.81), 1993.87 (± 0.47)
Machine learning	1960.56 (± 1.25), 1978.34 (± 0.86)
Macroeconomics	1968.52 (± 0.21), 2011.66 (± 0.67)
Management	1971.71 (± 1.17), 1988.61 (± 0.47)
Management science	1960.27 (± 0.65), 1971.68 (± 0.34)
Manufacturing engineering	1954.36 (± 2.02), 1983.66 (± 0.16), 2010.49 (± 0.12)
Marine engineering	1963.67 (± 1.03), 2008.39 (± 0.16)
Market economy	1976.81 (± 0.42)
Marketing	1969.26 (± 0.34), 1985.70 (± 0.59)
Materials science	1949.01 (± 0.99), 1964.78 (± 0.55), 2009.28 (± 0.20)

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Discipline	Breakpoints Year
Mathematical analysis	1948.28 (± 0.19), 1964.18 (± 0.51), 1978.39 (± 0.26), 2004.86 (± 0.48)
Mathematical economics	1966.39 (± 0.28)
Mathematical optimization	1952.69 (± 0.72), 1962.84 (± 0.31), 1979.20 (± 0.34)
Mathematical physics	1962.38 (± 0.62), 1979.54 (± 0.51), 1999.15 (± 0.47)
Mathematics	1948.63 (± 0.29), 1963.21 (± 0.61), 1977.43 (± 0.34)
Mathematics education	1940.29 (± 2.55), 1969.64 (± 0.55), 1983.48 (± 0.43)
Mechanical engineering	1970.80 (± 1.18), 1990.95 (± 0.61), 2010.34 (± 0.24)
Mechanics	1948.83 (± 0.96)
Media studies	1968.42 (± 1.10), 1989.53 (± 0.71), 2003.78 (± 0.27)
Medical education	1954.33 (± 1.07), 1975.58 (± 0.44), 1989.92 (± 0.49), 2000.58 (± 0.14)
Medical emergency	1965.60 (± 0.76), 1982.53 (± 0.79), 1999.82 (± 0.28)
Medical physics	1954.42 (± 1.99), 1981.52 (± 0.66), 2001.70 (± 0.25)
Medicinal chemistry	1956.37 (± 0.96), 1966.88 (± 0.61)
Medicine	1984.62 (± 0.84)
Metallurgy	1960.80 (± 0.38), 2008.24 (± 0.63)
Meteorology	1946.58 (± 0.28), 1975.44 (± 0.68), 1997.66 (± 0.50)
Microbiology	1935.56 (± 0.59), 1951.81 (± 0.61), 1969.68 (± 0.32), 2002.11 (± 0.33)
Microeconomics	1955.64 (± 1.05), 1967.30 (± 0.18), 1985.26 (± 0.27)
Mineralogy	1948.60 (± 0.33), 1962.69 (± 0.25), 1979.77 (± 0.32), 1999.00 (± 0.97)
Mining engineering	1946.79 (± 1.22), 1977.31 (± 0.77), 2010.40 (± 0.13)
Molecular biology	1955.29 (± 0.28), 1980.62 (± 0.39)
Molecular physics	1967.29 (± 0.50), 2009.50 (± 0.46)
Monetary economics	1971.34 (± 0.36)
Multimedia	1969.54 (± 2.45), 1987.46 (± 0.47)
Nanotechnology	1974.56 (± 0.87), 1998.65 (± 0.15)
Natural language processing	1960.59 (± 0.32), 1974.20 (± 0.34), 1987.90 (± 0.28), 2014.90 (± 0.16)
Natural resource economics	1970.22 (± 0.89), 1990.86 (± 0.66), 2009.60 (± 0.26)
Neoclassical economics	1960.34 (± 1.14), 1974.15 (± 0.42)
Neuroscience	1942.76 (± 1.33), 1958.82 (± 0.39), 2004.03 (± 0.88)
Nuclear chemistry	1952.43 (± 1.70)
Nuclear engineering	1958.44 (± 2.18), 1975.70 (± 0.66), 2006.65 (± 0.22)
Nuclear magnetic resonance	
Nuclear medicine	1951.72 (± 0.82), 1972.52 (± 0.53), 1992.76 (± 0.38)
Nuclear physics	
Nursing	1966.61 (± 0.45), 1980.43 (± 0.36), 1993.51 (± 0.21)
Obstetrics	1985.44 (± 0.70)
Oceanography	1954.57 (± 0.49), 1974.27 (± 0.49)
Oncology	1946.71 (± 1.83), 1971.40 (± 0.54), 2007.55 (± 0.32)
Operating system	1973.40 (± 0.54)
Operations management	1961.35 (± 0.60), 1980.85 (± 0.41), 2004.16 (± 0.43)
Operations research	1954.69 (± 0.63), 1969.13 (± 0.43), 1987.71 (± 0.32), 2005.41 (± 0.14)
Ophthalmology	1951.29 (± 0.88), 1976.65 (± 0.56), 1984.73 (± 0.40), 2000.81 (± 0.20)
Optics	1950.71 (± 0.60)
Optoelectronics	1957.60 (± 0.73)
Optometry	1929.53 (± 1.86), 1980.81 (± 0.35), 1999.28 (± 0.24)
Organic chemistry	1956.91 (± 0.41), 1969.69 (± 0.94), 2002.64 (± 0.29)
Orthodontics	1945.10 (± 0.59), 1978.72 (± 0.70), 1999.66 (± 0.45)
Paleontology	1950.55 (± 0.90), 1965.93 (± 0.42), 2004.85 (± 1.96)
Parallel computing	1962.91 (± 1.15), 1971.50 (± 0.48), 1998.00 (± 0.78)
Particle physics	1929.93 (± 1.90), 1949.36 (± 0.29), 1959.36 (± 0.53), 2005.00 (± 1.25)
Pathology	1967.59 (± 0.43), 1981.79 (± 0.81)
Pattern recognition	1958.78 (± 0.46), 1966.74 (± 0.22), 1987.33 (± 0.13), 2013.50 (± 0.17)
Pedagogy	1931.03 (± 0.85), 1976.23 (± 0.16)
Pediatrics	1981.16 (± 0.59), 1998.33 (± 0.33)
Petroleum engineering	1968.35 (± 0.83), 1980.57 (± 0.77), 2008.68 (± 0.06)
Petrology	1953.77 (± 0.65), 1968.45 (± 0.31), 2008.17 (± 0.29)
Pharmacology	1957.62 (± 0.44), 1964.67 (± 0.36), 1973.21 (± 0.23), 1985.50 (± 0.15), 2005.35 (± 0.26)
Philosophy	1966.68 (± 0.62), 1995.50 (± 0.62)
Photochemistry	1964.09 (± 0.67)
Physical chemistry	1961.61 (± 0.59), 1980.75 (± 0.87)
Physical geography	1973.00 (± 1.19), 1993.91 (± 1.11), 2015.00 (± 0.36)
Physical medicine and rehabilitation	1966.81 (± 0.90), 1980.27 (± 0.32), 1997.62 (± 0.26)

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Discipline	Breakpoints Year
Physical therapy	1955.68 (± 1.33), 1978.51 (± 0.34), 1991.83 (± 0.44)
Physics	1953.58 (± 0.21), 1976.28 (± 0.30), 2004.26 (± 0.75)
Physiology	1997.27 (± 2.06)
Political economy	1936.71 (± 2.49), 1964.65 (± 0.39), 1981.54 (± 1.15), 2000.23 (± 0.20)
Political science	1966.62 (± 1.14), 1992.78 (± 0.70)
Polymer chemistry	1935.67 (± 1.84), 1963.45 (± 0.58), 1995.59 (± 0.29)
Polymer science	1934.00 (± 1.66), 1969.23 (± 0.30), 2006.29 (± 0.59)
Positive economics	1969.61 (± 0.31)
Process engineering	1980.38 (± 1.05), 2008.74 (± 0.21)
Process management	1971.56 (± 0.90), 1993.48 (± 0.24)
Programming language	1959.95 (± 0.19), 1995.54 (± 0.57)
Psychiatry	1962.58 (± 0.32), 1977.54 (± 0.36)
Psychoanalysis	1939.33 (± 1.92), 1950.53 (± 1.13), 1983.68 (± 0.74)
Psychology	1960.54 (± 0.53), 1980.66 (± 0.84)
Psychotherapist	1951.71 (± 0.51)
Public administration	1971.62 (± 0.44), 1992.41 (± 0.59)
Public economics	1971.46 (± 0.30)
Public relations	1965.73 (± 0.66), 1974.57 (± 0.36), 1992.62 (± 0.31)
Pulp and paper industry	1983.32 (± 1.36), 2009.54 (± 0.28)
Pure mathematics	1949.47 (± 0.25), 1964.29 (± 1.08), 1976.41 (± 0.34), 2007.61 (± 0.27)
Quantum electrodynamics	1952.36 (± 0.24), 1972.36 (± 0.62)
Quantum mechanics	1961.34 (± 0.52)
Radiochemistry	1954.14 (± 0.57), 1970.39 (± 0.61), 1988.30 (± 0.59), 2008.29 (± 0.89)
Radiology	1949.60 (± 0.89), 1969.41 (± 0.29), 1999.11 (± 0.69)
Real-time computing	1962.26 (± 0.28), 1986.95 (± 0.23), 1998.61 (± 0.35)
Regional science	1956.92 (± 1.38), 1964.59 (± 1.11), 1977.78 (± 0.86), 2002.76 (± 0.20)
Reliability engineering	1954.39 (± 0.62), 1972.82 (± 0.30), 2009.09 (± 0.32)
Religious studies	1950.43 (± 1.87), 1969.37 (± 0.84), 1999.26 (± 0.30)
Remote sensing	1937.61 (± 3.34), 1949.68 (± 0.51), 1965.60 (± 0.45), 1980.31 (± 0.24), 1988.52 (± 0.35), 2009.51 (± 0.26)
Risk analysis (engineering)	1967.14 (± 1.37), 1982.35 (± 0.47), 1999.69 (± 0.39), 2009.41 (± 0.20)
Seismology	1952.85 (± 0.90), 1962.70 (± 0.41), 1981.78 (± 0.42)
Simulation	1957.67 (± 0.35), 1988.40 (± 0.24), 2003.27 (± 0.40)
Social psychology	1958.79 (± 0.28), 1980.79 (± 0.49), 2005.00 (± 1.29)
Social science	1948.46 (± 0.81), 1968.33 (± 0.16)
Socioeconomics	1970.40 (± 0.37), 1992.40 (± 0.70), 2001.38 (± 0.54)
Sociology	1948.87 (± 1.14), 1968.30 (± 0.24), 1989.03 (± 0.87)
Software engineering	1971.90 (± 0.37)
Soil science	1935.43 (± 0.66), 1951.08 (± 0.28), 1980.37 (± 0.46), 2006.42 (± 0.26)
Speech recognition	1962.36 (± 1.06), 1975.56 (± 0.46)
Statistical physics	1960.38 (± 0.56), 1973.31 (± 0.28)
Statistics	1943.52 (± 0.29), 1987.47 (± 0.83)
Stereochemistry	1950.32 (± 0.30), 1981.62 (± 1.48)
Structural engineering	1949.45 (± 2.08), 1967.28 (± 0.29), 2011.32 (± 0.26)
Surgery	1948.60 (± 1.20), 1977.48 (± 0.72), 1991.79 (± 0.71)
Systems engineering	1982.20 (± 0.24)
Telecommunications	1989.52 (± 0.56)
Theology	1950.57 (± 2.02), 1967.48 (± 1.31), 1996.84 (± 0.40)
Theoretical computer science	1958.28 (± 0.28)
Theoretical physics	1953.63 (± 1.15), 1967.50 (± 0.78), 1997.37 (± 0.17)
Thermodynamics	1951.60 (± 0.85)
Topology	1947.59 (± 0.20), 1963.40 (± 0.59), 1977.11 (± 0.26), 2000.83 (± 0.75)
Toxicology	1940.55 (± 1.02), 1969.36 (± 0.33), 2004.69 (± 0.54)
Traditional medicine	1983.81 (± 0.77), 2003.35 (± 0.26)
Transport engineering	1960.86 (± 0.45), 1995.59 (± 0.24), 2007.56 (± 0.27)
Urology	1945.62 (± 0.45), 1969.31 (± 0.56), 1993.86 (± 0.37)
Veterinary medicine	1945.30 (± 1.61), 1961.09 (± 1.58), 1979.72 (± 0.51), 1997.29 (± 0.43), 2004.88 (± 0.35)
Virology	1960.37 (± 0.20)
Visual arts	1967.39 (± 0.19), 2002.69 (± 0.21)
Waste management	1963.80 (± 0.99), 1979.47 (± 0.47), 1996.40 (± 0.37), 2007.64 (± 0.10)
Water resource management	1933.31 (± 1.16), 1982.00 (± 1.85), 1996.58 (± 0.36), 2006.71 (± 0.15)
Welfare economics	1967.47 (± 0.32), 2012.24 (± 0.55)
World Wide Web	1990.71 (± 0.43)
Zoology	1968.58 (± 0.45), 1997.38 (± 0.38)

Figure 1: The growth of KQI with breakpoints across disciplines, sorted in alphabetical order.









































