17 EQUATIONS THAT CHANGED THE WORLD

1. Pythagoras's Theorem (Pythagoras, 530 BC)
$$a^2 + b^2 = c^2$$
[1: Satz des Pythagoras](#)

2. Logarithms (John Napier, 1610)
$$\log xy = \log x + \log y$$
[2: John Napier](#)

3. Calculus (Newton, 1668)
$$\frac{df}{dt} = \lim_{h \to 0} \frac{f(t+h) - f(t)}{h}$$
[3: Calculus](#)

4. Law of Gravity (Newton, 1687)
$$F = G \frac{m_1 m_2}{r^2}$$
[4: Newtonsches Gravitationsgesetz](#)

5. Normal Distribution (C.F. Gauss, 1810)
$$\Phi(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$
[5: Minus_eins](#)

6. The Square Root of Minus One (Euler, 1750)
$$i^2 = -1$$
[6: Eulersche Formel](#)

7. Euler's Formula for Polyhedra (Euler, 1751)
$$V - E + F = 2$$
[7: Normalverteilung](#)

8. Wave Equation (J. d'Alembert, 1746)
$$\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$$
[8: Wellengleichung](#)

9. Fourier Transform (J. Fourier, 1822)
$$f(\omega) = \int_{-\infty}^{\infty} f(x) e^{-2\pi i x \omega} dx$$
[9: Fourier-Transformation](#)

10. Navier-Stokes Equations (C. Navier, G. Stokes, 1845)
$$\rho \left(\frac{\partial v}{\partial t} + v \cdot \nabla v \right) = -\nabla p + \nabla \cdot T + f$$
[10: Navier-Stokes-Gleichungen](#)

11. Maxwell's Equations (J.C. Maxwell, 1865)
$$\nabla \cdot E = \frac{\rho}{\varepsilon} \quad \nabla \cdot H = 0$$
$$\nabla \times E = -\frac{1}{c}\frac{\partial H}{\partial t} \quad \nabla \times H = \frac{1}{c}\frac{\partial E}{\partial t}$$
[11: Maxwell-Gleichungen](#)

12. Second Law of Thermodynamics (L. Boltzmann, 1874)
$$dS \geq 0$$
[12: Boltzmann-Gleichung](#)

13. Relativity (Einstein, 1905)
$$E = mc^2$$
[13: Äquivalenz Masse Energie](#)

14. Schrodinger's Equation (E. Schrodinger, 1927)
$$i\hbar \frac{\partial}{\partial t} \Psi = H\Psi$$
[14: Schrödingergleichung](#)

15. Information Theory (C. Shannon, 1949)
$$H = -\sum p(x) \log p(x)$$
[15: Entropie Informationstheorie](#)

16. Chaos Theory (Robert May, 1975)
$$x_{t+1} = kx_t(1 - x_t)$$
[16: Chaosforschung](#)

17. Black-Scholes Equation (F. Black, M. Scholes, 1990)
$$\frac{\partial V}{\partial t} + \frac{1}{2}s^2 s^2 \frac{\partial^2 V}{\partial S^2} + rS\frac{\partial V}{\partial S} - rV = 0$$
[17: Black-Scholes-Modell](#)