

Ten Smartest Scientists

1. Gottfried Leibniz (IQ 205)
2. Blaise Pascal (IQ 195)
3. Philip Emeagwali (IQ 190)
3. Sir Isaac Newton (IQ 190)
3. Pierre Laplace (IQ 190)
6. Rene Descartes (IQ 185)
6. Galileo (IQ 185)
8. Johannes Kepler (IQ 175)
9. Charles Darwin (IQ 165)
10. Albert [Einstein](#) (IQ 160)

Note: The IQs of these scientists were compiled from various books, and websites. The high IQs are assigned to scientists that solved grand challenge mathematical problems, such as the ones below.

THE GRAND CHALLENGE EQUATIONS

$$B_i A_i = E_i A_i + \rho_i \sum_j B_j A_j F_{ji} \quad \nabla \times \vec{E} = - \frac{\partial \vec{B}}{\partial t} \quad \vec{F} = m \vec{a} + \frac{dm}{dt} \vec{v}$$

$$dU = \left(\frac{\partial U}{\partial S} \right)_V dS + \left(\frac{\partial U}{\partial V} \right)_S dV \quad \nabla \cdot \vec{D} = \rho \quad Z = \sum_j g_j e^{-E_j/kT}$$

$$F_j = \sum_{k=0}^{N-1} f_k e^{2\pi i j k / N} \quad \nabla^2 u = \frac{\partial u}{\partial t} \quad \nabla \times \vec{H} = \frac{\partial \vec{D}}{\partial t} + \vec{J}$$

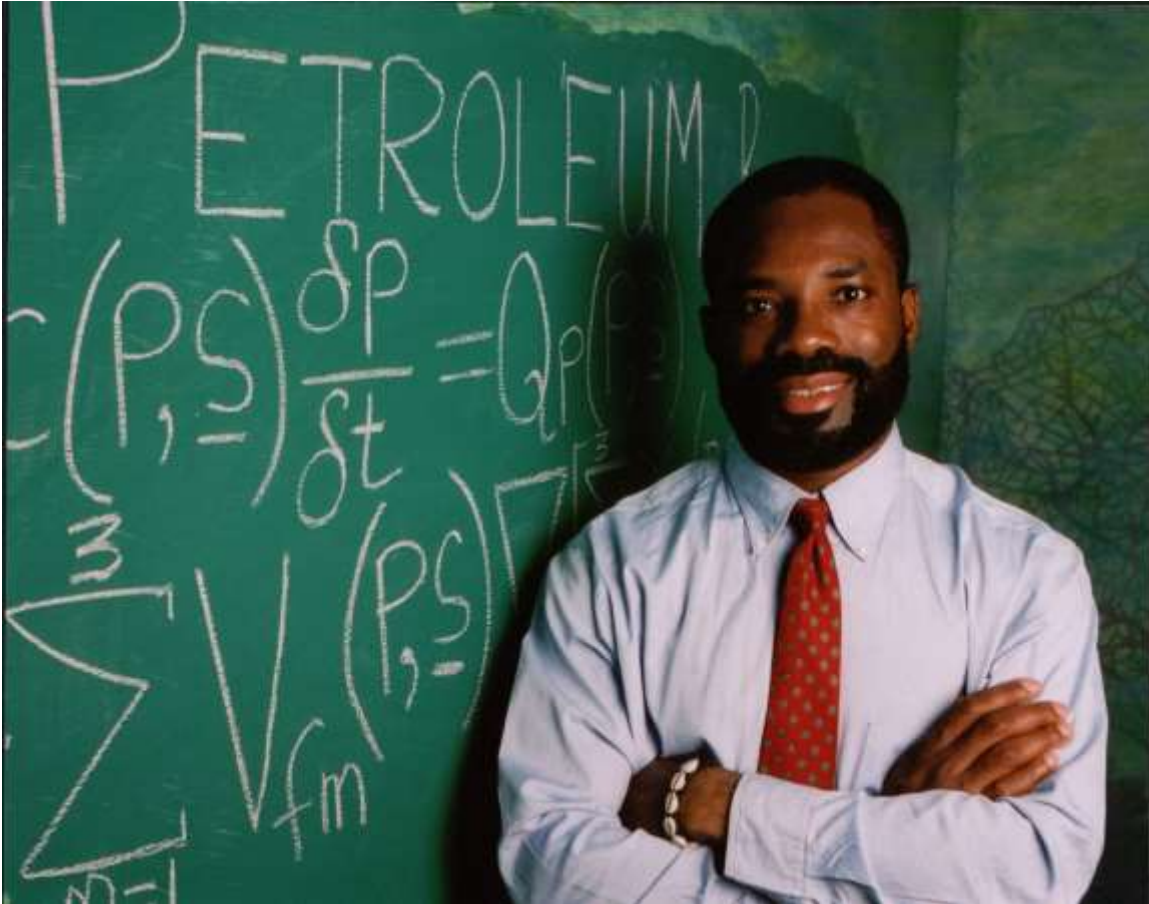
$$P_{n+1} = r p_n (1 - p_n) \quad \nabla \cdot \vec{B} = 0 \quad P(t) = \frac{\sum_i W_i B_i(t) P_i}{\sum_i W_i B_i(t)}$$

$$- \frac{\hbar^2}{8\pi^2 m} \nabla^2 \Psi(r, t) + V \Psi(r, t) = - \frac{\hbar}{2\pi i} \frac{\partial \Psi(r, t)}{\partial t} \quad -\nabla^2 u + \lambda u = f$$

$$\frac{\partial \vec{u}}{\partial t} + (\vec{u} \cdot \nabla) \vec{u} = - \frac{1}{\rho} \nabla p + \gamma \nabla^2 \vec{u} + \frac{1}{\rho} \vec{F} \quad \frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} = f$$

• NEWTON'S EQUATIONS • SCHRÖDINGER EQUATION (TIME DEPENDENT) • NAVIER-STOKES EQUATION •
 • POISSON EQUATION • HEAT EQUATION • HELMHOLTZ EQUATION • DISCRETE FOURIER TRANSFORM •
 • MAXWELL'S EQUATIONS • PARTITION FUNCTION • POPULATION DYNAMICS •
 • COMBINED 1ST AND 2ND LAWS OF THERMODYNAMICS • RADIOSITY • RATIONAL B-SPLINE •

Philip Emeagwali discovered critical errors in the most important of the twenty grand challenges and corrected them, across the storyboard, blackboard, and 65,536 motherboards.



Philip Emeagwali discovered errors in century-old Grand Challenge equations used to recover oil and corrected them, on both the blackboard and his 65,536 motherboards. An equation [or equality, formula, or identity] states that two or more quantities are the same. A partial differential equation is defined by functions and their partial derivatives. The equations on the above green board are to geophysics what $E=mc$ squared is to physics. Imagine if Albert Einstein made an error and wrote $E=mc$ and Philip Emeagwali corrected it to " mc squared." Philip Emeagwali made a similar correction, named 36 partial derivative terms, to the above equation. It's complete form, including annotations, footnotes, and Emeagwali's differential and difference terms occupied the space of a dozen black boards, including the brief footnotes below.

$c(p, \underline{s})$ = compressibility of the fluids

p = pressure

$Q_p(p, \underline{s})$ = source/sink terms such as production wells

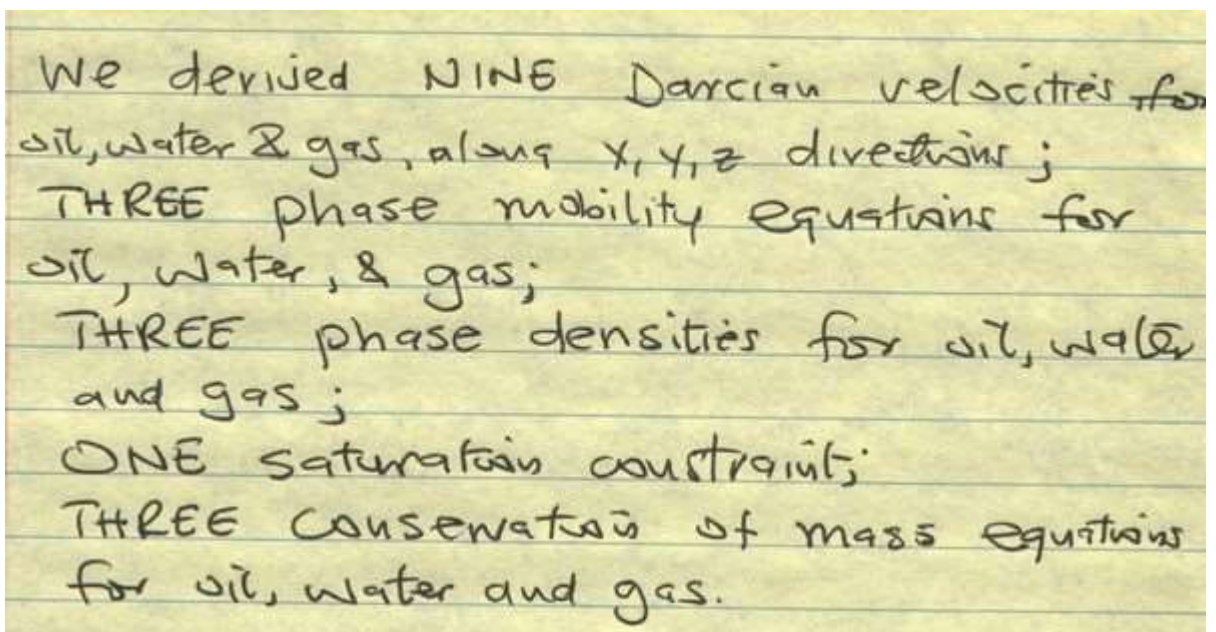
$V_{fm}(p, \underline{s})$ = fluid partial molar volumes

$X_{fm}(p, \underline{s})$ = fluid component densities

s = saturation

$\underline{V}_m(p, \underline{s})$ = phase partial molar volume

$u(p)$ = total fluid velocity



We derived NINE Darcian velocities for oil, water & gas, along x, y, z directions;
THREE phase mobility equations for oil, water, & gas;
THREE phase densities for oil, water and gas;
ONE saturation constraint;
THREE conservation of mass equations for oil, water and gas.

where

$K \approx$ & $D_{ki} \approx$: permeability, dispersion tensors, resp.

ϕ : porosity

K_{ri} : relative permeability for oil, water, gas

n_p : number of phases

n_c : number of components

V_i : Darcian velocities

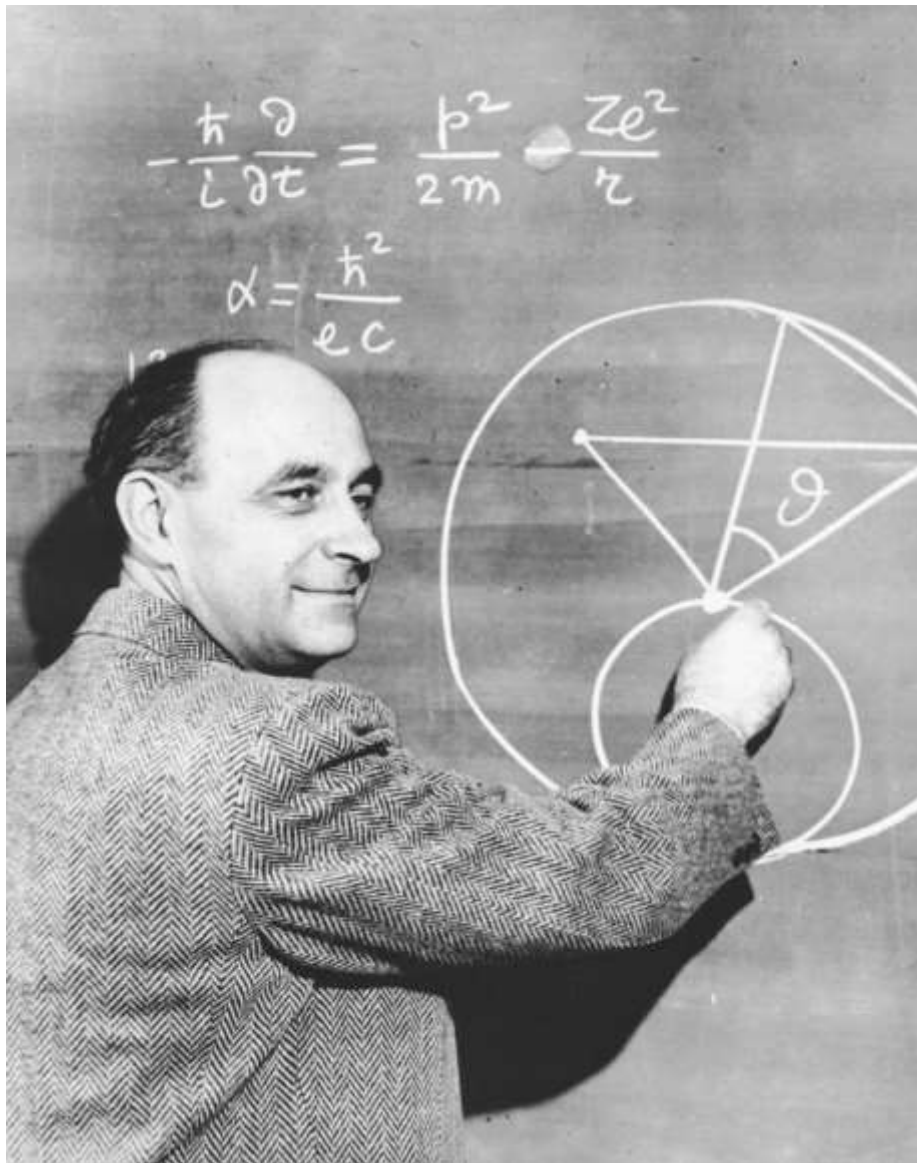
S_i, P_i : saturations, pressures for oil, water, gas

ρ_i, μ_i : densities, viscosities for oil, water, gas

γ_i : pressure gradients for oil, water, gas,

X_{ki} : Mole fraction of component k in oil, water, gas

Another School Boy Error



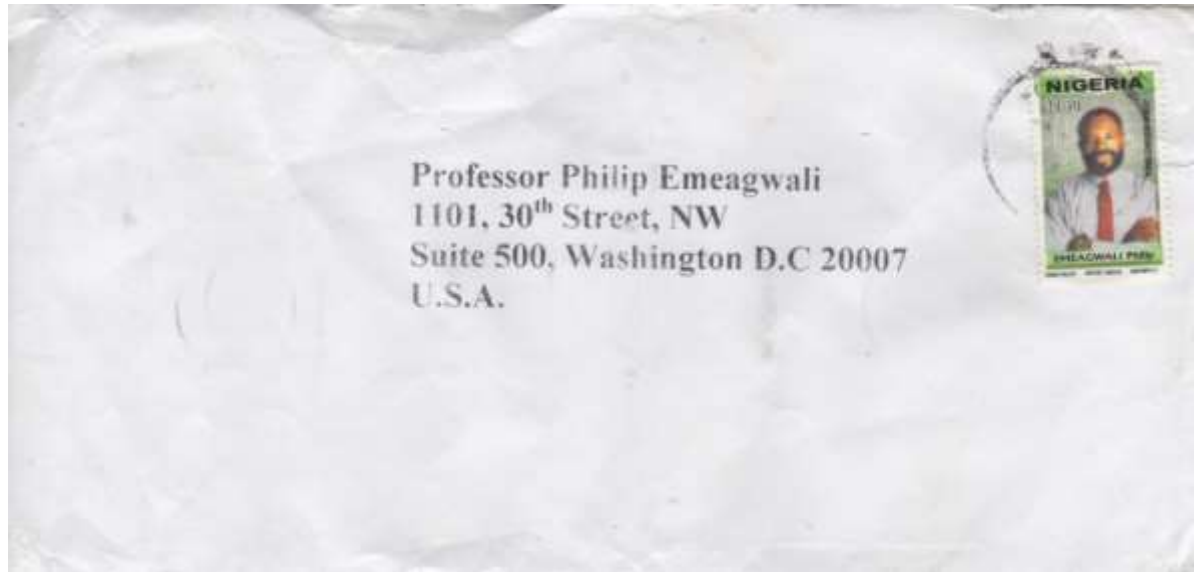
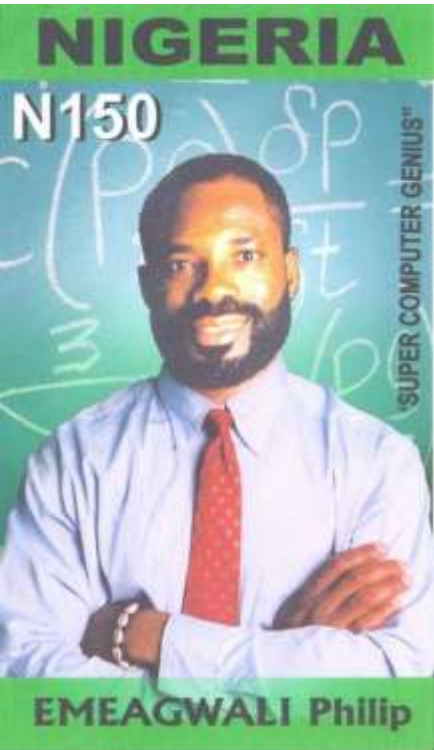
“The Father of the Atomic Bomb” and physics Nobel Laureate Enrico Fermi was nicknamed “The Pope” because colleagues described him as “infallible.” Yet, Fermi made school-boy algebra error in a simple equation he wrote on the above blackboard.

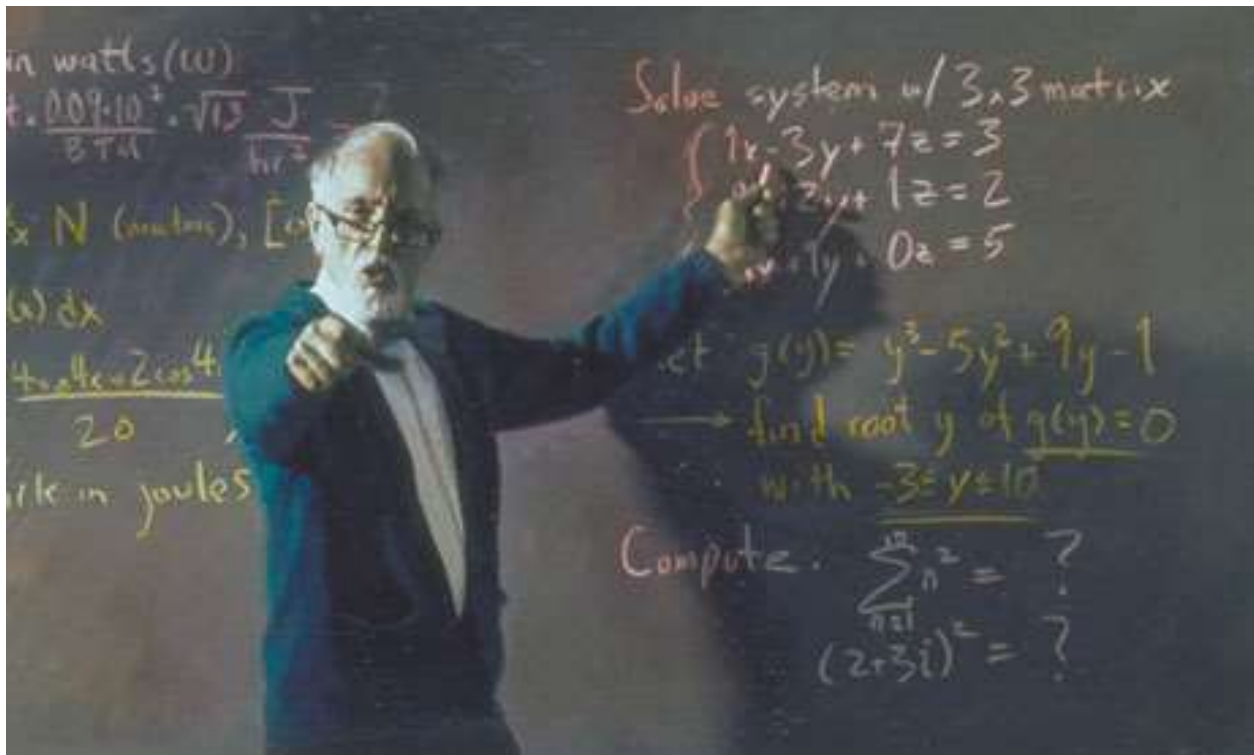
It is important to double-check equations written in all physics textbooks. Enrico Fermi, father of the sustained nuclear chain reaction and the 1938 Nobel Laureate in Physics, did not understand an important equation in physics. Fermi reversed the simple algebraic equation relating alpha, h bar and e. Fermi wrote $\alpha = \frac{\hbar^2}{ec}$ [a =

$(\hbar)^2/ec$, instead of $\alpha = \frac{e^2}{\hbar c}$ [$a = e/((\hbar)c)$]. It is the equation for the "fine-structure constant" That number determines the strength of electric and magnetic forces.



Without correcting the error, the Italian and United States Postal Services reproduced it in stamps that commemorated Fermi's discoveries and his 100th birthday.





Generally, people can solve 3 x 3 matrix on the blackboard. Philip Emeagwali used 65,536 motherboards to solve 24 million matrix. Both--65,536 and 24 million--were world records in the 1980s.

The Second Law of Motion, without the fourth of four forces, was integrated with the Laws of conservation of oil and gas and their equations of states to obtain the following:

$$\nabla \cdot [\lambda_o K (\nabla P_o - \rho_o g)] = \frac{\partial}{\partial t} \left(\frac{\Phi S_o}{B_o} \right) + q_{r_o}$$

oil phase pressure $\textcircled{1}$ oil density volumetric production rate per unit oil reservoir volume ~~the~~

$$\nabla \cdot [\lambda_w K (\nabla P_w - \rho_w g)] = \frac{\partial}{\partial t} \left(\frac{\Phi S_w}{B_w} \right) + q_{r_w}$$

water phase saturation $\textcircled{2}$ The constant rock porosity gravitational acceleration vector negative when injecting water into reservoir

$t > 0,$
 $x = (x, y, z) \in \Omega,$

Use "Simultaneous Solution Method" to solve all four equations, boundary and initial conditions. Two PDEs (above); Four unknowns S_o, S_w, P_o, P_w ; Use two functional relationships below to solve PDE's saturation and pressure distributions.

$$S_o + S_w = 1 \quad \textcircled{3}$$

$$P_{cow} = P_o - P_w = f(S_w) \quad \textcircled{4}$$

I.C.s. $P_L(x, y, z, 0) = P_L^0(x, y, z), \quad x \in \Omega$
 $L = 0, \omega,$

B.C.s. $\rightarrow P_L$ Use $\textcircled{3}$ and $\textcircled{4}$ to remove saturations in $\textcircled{1}$ and $\textcircled{2}$. which then contains only oil pressure (P_o) and water pressure (P_w)

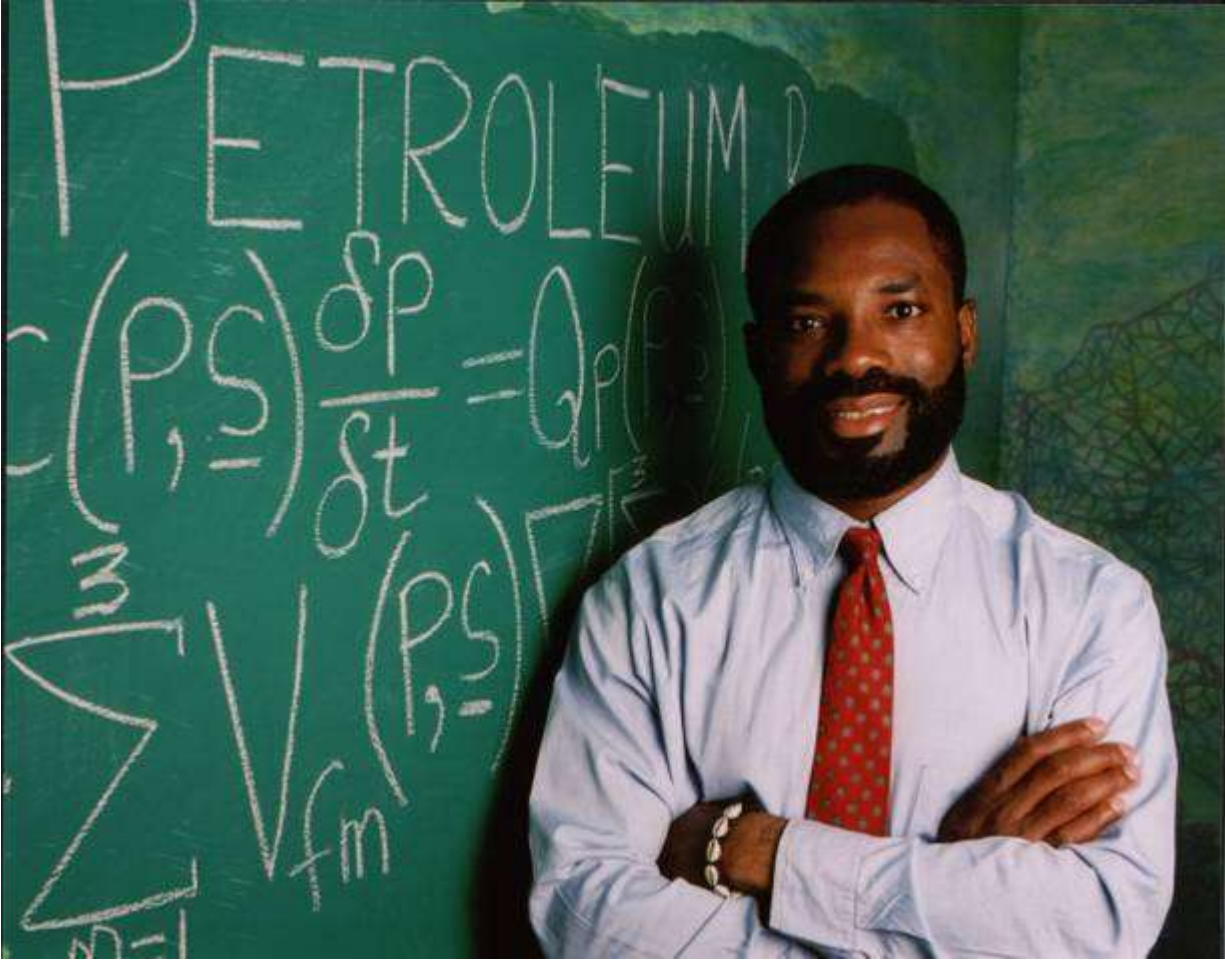
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IQ Score 205



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IQ Score 195



3. Philip [Emeagwali](#)

IQ Score 190



3. Sir Isaac Newton

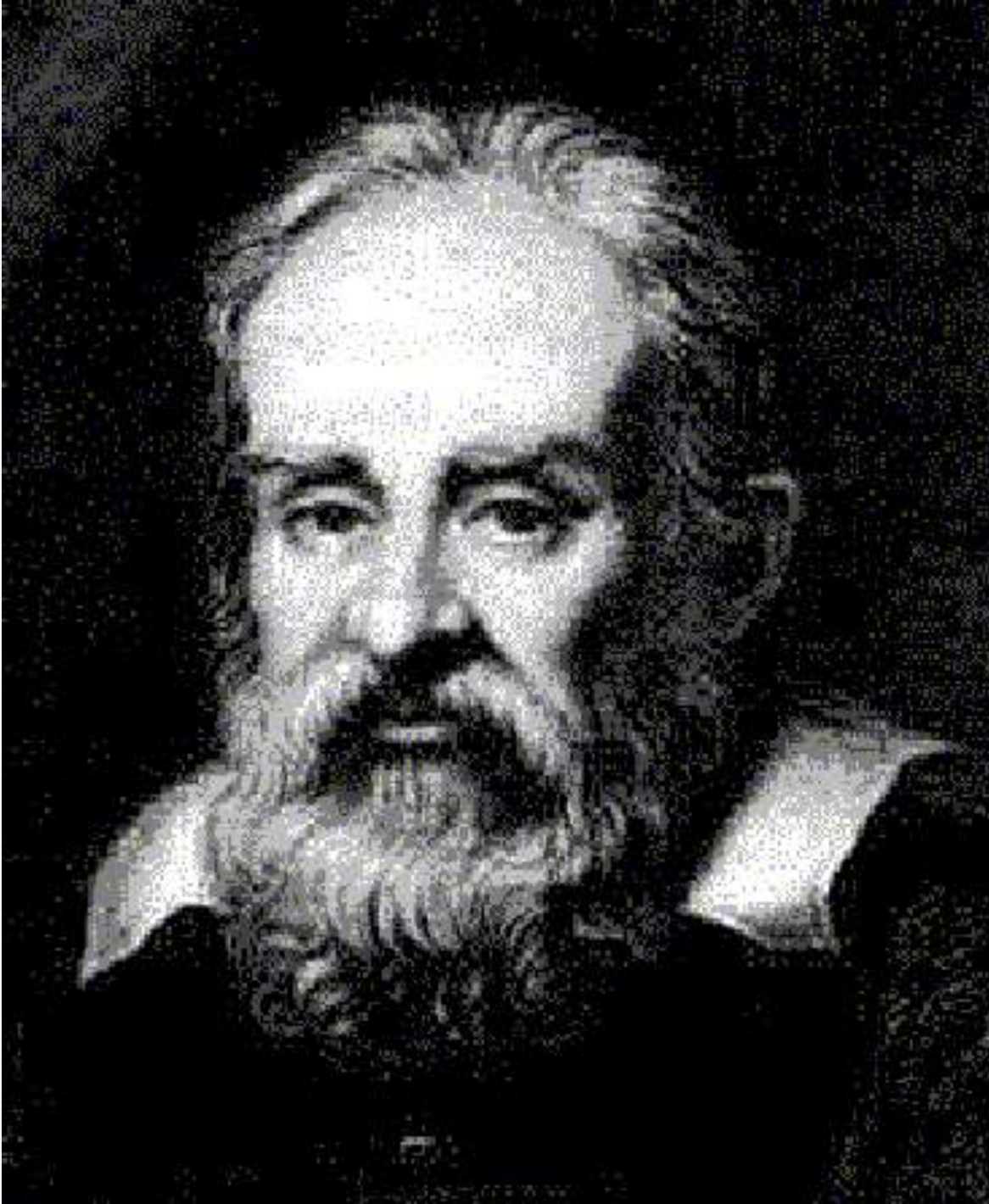
IQ of 190



3. Pierre Laplace
IQ Score 190



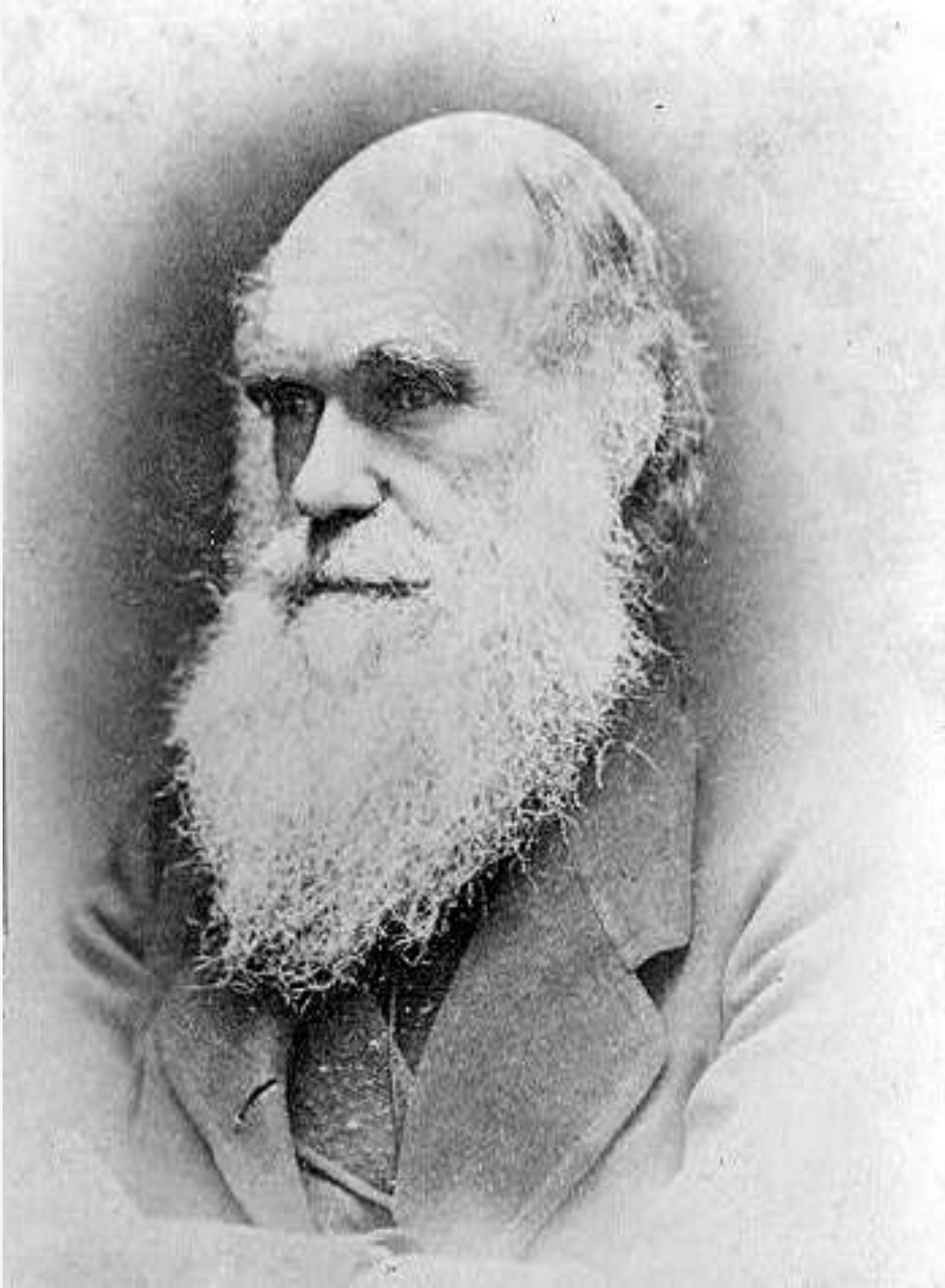
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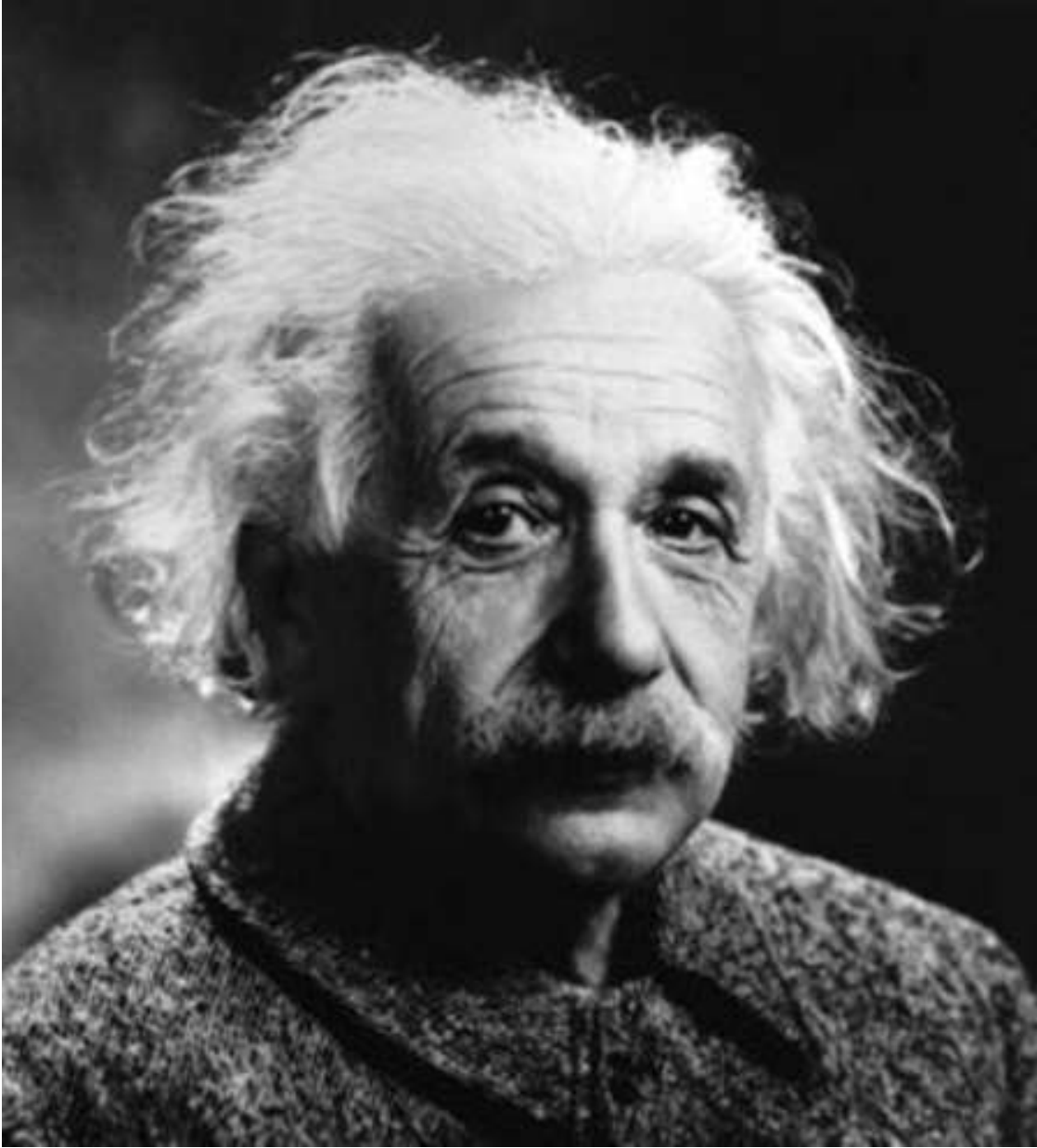
6. Galileo
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8. Johannes Kepler
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9. Charles Darwin
IQ Score 165



10. Albert Einstein

IQ Score 160

IQ Chart

Designation	Intelligence interval
Average	85 - 115
Above average	115 - 125
Gifted	125 - 135
Highly gifted	135 - 145
Genius	145 - 155
Genius	156 - 165
High genius	166 - 180
Highest genius	181 - 200