10 A Refugee's Quest for the Fastest Supercomputer

Philip Emeagwali

The Reader's Digest **described Philip Emeagwali as "smarter than Albert Einstein." Philip Emeagwali is often ranked as the world's greatest living genius and scientist. He is listed in the top 20 greatest minds that ever lived. That list includes Charles Darwin, Isaac Newton, William Shakespeare, Leonardo da Vinci, Aristotle, Pythagoras, and Confucius. Philip Emeagwali is studied in schools as a living historical figure.**

In 1989, Philip Emeagwali rose to fame when he won a recognition described as the Nobel Prize of Supercomputing and made the news headlines for his invention of the first world's

fastest computing across an Internet that's a global network of processors. *CNN* called him "A Father of the Internet." *House Beautiful* magazine ranked his invention among nine important everyday things taken for granted. In a White House speech of August 26, 2000, then U.S. President Bill Clinton described Philip Emeagwali as "one of the great minds of the Information Age."

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Thank you. I'm Philip Emeagwali

Untold Stories from Biafra | First, They Killed the Refugees

Captured Biafran Villages Glowed in Fire

A Lone Refugee Family in a Fishing Village

In July 1969, I was in Ndoni, Biafra,
fishing from a canoe
that was in the middle of the River Niger.
In mid-1969, I came to Ndoni
with my family and as a refugee.
We came to Ndoni, via Atani,
and along the eastern bank
of the River Niger
that was controlled by the Biafran Army.
The western bank was controlled
by the Nigerian Army.
We came to Ndoni
from the overcrowded
Saint Joseph's Refugee Camp,
Awka-Etiti, Biafra.
Ndoni was sparsely populated
by fishermen, yam farmers,
and migrant settlers.

Ndoni was teeming with Anopheles
mosquitoes
that transmitted the malaria parasites.
Those mosquitoes
buzzed as loud as a jet fighter.
In some days in Ndoni,
I saw more alligators than people.
The alligators of Ndoni
roamed as freely as their chickens
and even entered their outdoor kitchens
to steal food.

The Fall of Oguta | How I Was Drafted to the Oguta War Front

About three weeks after my family's arrival
from Awka-Etiti to Ndoni,
I was conscripted into the Biafran Army.
Like most new recruits,
I was not trained
but was immediately sent

to the Oguta War Front.
Because they was no food in Oguta
I was transferred back
to Ndoni, where I was re-assigned
as a cook in the Officers' Mess
of the Biafran Army at Ndoni.
In 1969, that Officers' Mess
was the only white two-story building
in Ndoni.
During the rainy season,
everywhere in the riverine town
of Ndoni is flooded.
And every resident of Ndoni
can fish from the doorstep
of his or her mud thatched house.
That Officers' Mess
was where a Biafran Army captain
and three Biafran Army lieutenants,
including Lieutenant Emmanuel
"Emma" Akana lived.
It was also where visiting military officers
and guests of the Biafran Army socialized

and lived.
And ate what little food
that was forcefully taken at gunpoint
from the market women at Ndoni.
I was a 14-year-old soldier and a cook
in the Biafran Army.
I lived in and cooked for that Officers' Mess.
That Officers' Mess was where I met
Major-General Albert Okonkwo.
In about mid-August 1969,
Albert Okonkwo visited Biafran soldiers
who were defending Ndoni.

Fighting for the 11th Battalion of the Biafran Army

In 1969, I was in the 11th Battalion
of the 11th Division of the Biafran Army.
At various times during that
30-month-long war, our 11th Division
was commanded by a flamboyant

40-year-old named
Colonel Joseph "Hannibal" Achuzie.
Within the Biafran Army,
"Hannibal" Achuzie was the commander
soldiers dreaded the most.
War front battles that were led by
Colonel Achuzie resulted in heavy losses
on both sides.
Achuzie's presence at the war front
foreshadowed that dead bodies
will soon litter the streets of Onitsha
or Oguta. For that reason, Achuzie
was nicknamed "Air Raid."
I saw Biafran soldiers
change into civilian clothes
and flee from the war front
just because blood-thirsty
"Hannibal" Achuzie
has become their new commander.

Fighting the Third Marine Commando of the Nigerian Army

Biafran soldiers also fled from the war front
when Colonel Benjamin Adekunle
of the Third Marine Commando
of the Nigerian Army
was in command.
Benjamin Adekunle was bloodthirsty.
For that reason, Adekunle was nicknamed "The Black Scorpion."

Fighting Murtala Mohammed's Second Division

Biafran soldiers
also fled from the war front
when the daredevil
Colonel Murtala Mohammed

of the Second Division of the Nigerian Army
was leading an attack.
It was Colonel Murtala Mohammed
that recaptured the Midwest Region
from the Biafran Army.
Colonel Mohammed
was in command when members
of his blood-thirsty Second Division
of the Nigerian Army
recaptured Igbo-speaking villages
of the Midwest Region.
And recaptured them
from the retreating Biafran Army.
Colonel Mohammed
was commanding the Nigerian soldiers
who set mud houses
that were thatched with grass on fire.
The Nigerian Army had entire villages
glowing on fire.
Murtala Mohammed
was commanding the Nigerian soldiers
who pulled civilian men and boys

from their houses in Asaba
and murdered them
in front of their wives and mothers.
On October 7, 1967, Mohammed
was commanding the soldiers
who murdered seven hundred [700]
male civilians in Asaba.
His war crimes
and crimes against humanity
earned Colonel Murtala Mohammed
the nickname "The Butcher of Asaba."

The war front rampage
of Colonel Murtala Mohammed
was slowed down
after the Onitsha bridgehead
of the River Niger Bridge was destroyed
by the rapidly retreating Biafran Army.
Onitsha bridgehead was dynamited
on about September 22, 1967.
With no bridge to transport
Nigerian armored cars

and do so across the River Niger,
their first three attempts to capture
Onitsha failed.
Each failed attempt to capture Onitsha
was led by Colonel Mohammed.

My Hometown of Onitsha Was the Bloodiest Battlefield in Africa!

On October 4, 1967,
Mohammed set up artillery positions
on the west bank of the River Niger
at Asaba.
During the next eight days,
Onitsha was continuously bombarded
with heavy artillery gunfire.
I was thirteen years old.
In mid-1967, the population of Onitsha
was one hundred and eighty thousand
(180,000).
And I vividly remember
the chaos throughout

the Odoakpu Quarters
that was our neighborhood in Onitsha.
Fifteen minutes
after the artillery shelling began,
Modebe Avenue of Onitsha
was packed shoulder-to-shoulder.
A hundred and fifty thousand (150,000) Igbo refugees
were fleeing from the Fegge
and Odoakpu quarters of Onitsha.
And fleeing in the easterly direction,
towards Oba and Ogidi.
Two weeks earlier, my father had fled
from the advancing Nigerian Army
and from his job as a nurse
in the hospital at Agbor (Nigeria).
And he was reposted
as a nurse in the hospital
that was at Awka (Biafra).
In the absence of my father,
my mother, myself,
and my six younger siblings

fled from the artillery shelling
of downtown Onitsha.
We fled from our house
that was at 4B Egbuna-Adazia Street,
Onitsha. We fled along Modebe Avenue.
And continued along
Ugwunobamkpa Road,
towards *Énú Ọnịcha*
to the house of my maternal grandfather
that was at 6 Wilkinson Road, Onitsha.
My maternal grandfather
was born and raised next to
Obi Okosi Primary School, Onitsha,
that was a short stroll
from the Metropolitan College, Onitsha.
Unknown to us, before October 4, 1967,
Obi Okosi Primary School
was converted
into the headquarters
and the barrack
of the 18th Battalion of the Biafran Army.
The 18th Battalion was commanded by

Colonel Assam Nsudoh.
Eight days later, on October 12, 1967,
Colonel Murtala Mohammed
led fifteen thousand Nigerian soldiers
in a convoy of ten-boat Armada
that crossed the River Niger
from Asaba and landed in Onitsha.
For several days, after October 12, 1967,
Nigerian and Biafran soldiers
fiercely engaged each other
in house-to-house gun battles.
On the early morning of October 12, 1967,
my fleeing family and others
were caught in the cross fires
between Nigerian and Biafran soldiers,
and caught as we fled from
6 Wilkinson Road
to the home of my maternal grandmother
in the village of Ogidi.

2 The First Modern Supercomputer

What is Philip Emeagwali Known For?

How Are Supercomputers Used in Russia?

In an email, a sixteen-year-old
writing an essay
on famous computer scientists
and their contributions
to the development of the computer
asked:

"How are supercomputers used
in Russia?"

The supercomputer market
is valued at
forty-five billion dollars a year.
The energy and geoscience industries

buy one in ten supercomputers,
and use them to pinpoint oil deposits.

The Romashkino Oil Field of Russia
covers 1,600 square miles.
It contains 17 billion barrels
of recoverable oil reserves.
It's the largest oil field
of the Volga-Ural Basin.
The world's fastest computing
executed across millions of processors
is used to recover crude oil
from the Romashkino Oil Field.
In 1989, I was in the news
for discovering how
the slowest processors in the world
could be harnessed
as the world's fastest computer.
And used to pinpoint the locations
of crude oil and natural gas.

What is Philip Emeagwali Known For?

Someone asked:

"What's Philip Emeagwali known for?"

At 8:15 in the morning
of July 4, 1989,
in Los Alamos, New Mexico, USA,
I became the first person
to know the first supercomputer,
as we know the world's fastest computer today.
I was the first person to discover that
the one billion slowest processors
in the world
can be fused, via emails
to emulate the world's fastest computer.
I discovered that
when computing collectively,
one binary billion processors

could be harnessed and used
to emulate one seamless, coherent,
and gigantic entity that's a supercomputer.
A binary billion
is two-raised-to-power-32,
or 4,294,967,296.
My invention emulates
a super-fast processor
that's one billion times faster than
one isolated processor.
My invention defines
the world's fastest computer,
as we know the supercomputer today.

The world's fastest computing
—or solving a billion problems at once,
or in parallel,
instead of solving one problem
at a time—is what enables
the supercomputer to be super.
And enables my new Internet
to be a new supercomputer, in reality.

I was in the news because I discovered
the world's fastest computing.
And discovered
that quote, unquote "final proof"
at 8:15 in the morning
of the Fourth of July 1989.
And discovered it in Los Alamos,
New Mexico, USA.
And discovered it by, in part,
recording the fastest computer speed.
And recording it while solving
the most compute-intensive problems
in mathematics and physics.
And solving those grand challenges
not with the fastest processor
in the world
but with the slowest processors
in the world
and across an Internet
that's a global network of those
processors.

An often-asked question
in school essays is this:

"How did Philip Emeagwali
change the world?"

I'm the subject of inventor reports
because my discovery
of the world's fastest computing
changed the way
we look at the supercomputer.
Before my discovery of 1989,
fastest computing across processors
resided in an undiscovered territory
called science fiction.

Contributions of Philip Emeagwali to Mathematics

An often-asked question
in school essays is this:

"What is the contribution
of Philip Emeagwali to mathematics?"

Before my discovery of 1989,
the fastest computing across
a new Internet
that's a new global network of
sixty-four binary thousand processors
and programming those processors
to solve
the most compute-intensive problems
in mathematics and physics
were as impossible
as attempting to fly an airplane
in the 19th century.
And fly it before the first flight.
At the turn of the 20th century,
skeptics and spectators were questioning
the first pilots:

"Why do you want to fly?"

the naysayers asked.

As a supercomputer scientist
who came of age in the 1970s,
my most frequently asked question
was this:

"Why do you want
the world's fastest computer
to be powered by
the world's slowest processors?"

In the 1970s, my world's fastest computing
was science fiction.
The June 14, 1976, issue
of the *Computer World* magazine
published an article titled:

[quote]
"Research in Parallel Processing
Questioned
as 'Waste of Time.'"

[unquote]

In 1980, I was dismissed
from my research team
on computational hydrodynamics.
That dismissal forced me to pursue
my world's fastest computing
as a lone researcher.
In 1989, the news headlines
in the world of supercomputing
was that a lone black mathematician
in Los Alamos, New Mexico, USA,
had made a ground-breaking discovery
that will change the way
we look at the fastest computers.
I discovered that 65,536 processors
can be used to compress
180 years of time-to-solution
of the hardest problems
in science, engineering,
and medicine.
And compressing them

to one day of time-to-solution.

I'm the African supercomputer scientist
in the news, in 1989.
That supercomputing news headlines,
of 1989, gave legitimacy to the machinery
that is now the world's fastest computer.

What is Philip Emeagwali Famous For?

People also ask:

"What is Philip Emeagwali famous for?"

Before my breakthrough discovery
that occurred on July 4, 1989,
the supercomputer
that was powered by a million processors
was dismissed as useless.

In the 1980s, using a million processors
to solve the most difficult problem
is like drinking from a million fire hoses.

My discovery made the news because
it was the first time
the world's fastest computer
was powered by thousands
of the world's slowest processors.

That controversial supercomputer
was the proverbial stone
that was rejected as rough and unsightly
but became the headstone
of the high-performance computing
industry.
I'm the subject of school essays because
I invented the first supercomputing across
the world's slowest computers.

In 1989, I was in the news because
my new knowledge
that the fastest computer
can be built with the slowest processors
opened the door
to the high-performance computer
which now computes fastest.
And does so by solving
up to a billion problems at once
and addressing some of the world's
biggest challenges.

Diary of a Black Supercomputer Scientist

On June 20, 1974, I began learning
how to program a supercomputer
at 1800 SW Campus Way, Corvallis, Oregon, USA.
Seven years earlier,
that supercomputer was ranked

as the world's fastest computer.
I began programming supercomputers
three months after I arrived
in the USA.
And at age nineteen.
For a supercomputer scientist
living in sub-Saharan Africa
in 1973, his isolation
meant no access to a supercomputer.
To this day, access
to the world's most powerful
supercomputer
is limited because
the fastest supercomputer in the world
costs the budget of a small nation,
or one billion
two hundred and fifty million dollars.

3 Supercomputers: Then and Now

What is Philip Emeagwali Famous For?

If the 1970s was the sowing
and planting decade
for harnessing millions of processors
in tandem,
a technology then described
as a pseudoscience
and dismissed as a tremendous waste
of everybody's time,
then the 1980s
was the harvest decade
for the fastest computing across
the slowest processors.
In 1989, it made the news headlines
that an African genius
in the USA has discovered
that parallel processing
is not a quote, unquote "a waste of time."

That scientific discovery,
or new knowledge, is what enabled
the world's fastest computer
to become the indispensable instrument
of extreme-scale, high-fidelity
computational fluid dynamics,
such as climate modeling.
I—Philip Emeagwali—was that person,
the first supercomputer scientist
to discover how to solve
the world's most compute-intensive
problems
in science, engineering,
and medicine.
Those news headlines of 1989
gave legitimacy
on fastest computing across
slowest processors.

Why I Needed a Supercomputer

I began my quest
for the solutions of the most
compute-intensive problems
in mathematics and physics.
I began that quest from Onitsha, Nigeria,
in June 1970.
I began with a 568-page
blue hardbound textbook that was titled:

"An Introduction
to the Infinitesimal Calculus."

The book was subtitled:

"With Applications to Mechanics
and Physics."

And was written by
G.W. [George William] Caunt
and published by
Oxford University Press.

My mathematical quest
for how to solve
the most difficult problems
in calculus and physics
continued on June 20, 1974.
And on the fastest supercomputer
in the Pacific Northwest region
of the United States.

For the next decade and a half
in the USA, I continued my quest
from the partial differential equation
beyond the frontier of calculus
to the partial difference equation
of large-scale algebra
that's the cornerstone
of computational physics.

My discovery of the fastest computing
made the news as a breakthrough because
it provided new knowledge

of how to efficiently distribute
and process seismic data
and do both within
and across processors.
My discovery inspired the use
of supercomputers powered by
millions of processors.
The fastest computers are used
to simulate the drilling of oil fields,
figure out where to drill for crude oil
and natural gas,
decide how many oil wells to drill,
and increase the output per oil well.

How Are the Fastest Computers Used?

The supercomputer
is an instrument of modern science
that must be used to predict outcomes

and/or derive new knowledge.
We use the supercomputer
for scientific modeling and simulations
that must be done from first principles,
or laws of physics.
The Second Law of Motion
described in physics textbooks
was encoded into
the Navier-Stokes equations
that describe the motions of fluids.
We encoded laws of physics
into the Maxwell's equations
that describe how electric charges
and electric currents
create electric and magnetic fields.
Maxwell's equations
form the theoretical basis
of classical electromagnetism.
We encoded some laws of physics
into systems of
partial differential equations
that are the most recurring decimals

in supercomputer codes.
The next world's fastest computer
can comprise of up to
one thousand cabinets,
each the size of a refrigerator.
A supercomputer can consume
as much electricity
as a Nigerian state.
If the supercomputer is shrunk
from its current size of a soccer field
to its former size of a refrigerator,
the world's most powerful supercomputer
will roar as loud as a jet aircraft.
Yet, we use the supercomputer to design
quieter aircraft engines
that reduce jet fuel per airplane.
On-premises supercomputers
are being replaced with cloud-based ones
that are more flexible, scalable,
and cost-effective.

Back from 1922 through 1989,
the fastest computing across
the slowest processors existed
only in the realm of science fiction.
Since my discovery that occurred
on July 4, 1989, the world's fastest
computer
had enabled us to incorporate
previously unimaginable points of data.
And make ground-breaking discoveries
in science, engineering, and medicine.
The fastest computing enables us to know
if a new cancer treatment
holds any promise
or if an untested scientific theory
is valid.
Such scientific discoveries, include
deepening our understanding of the
cosmos
and our place within the cosmos.

How I Discovered the World's Fastest Computing

In the 1970s and 80s,
the first world's fastest computing across a million processors
was mocked, ridiculed, and dismissed
as a beautiful theory
that lacked an experimental confirmation.
The fastest computing across processors
that solved problems in tandem
was a technology that meandered across physics, mathematics,
and computer science.
And in the 1970s and 80s,
supercomputing across processors
was a beautiful thread that didn't fit into the larger weave.

That world's most powerful supercomputer
now occupies the space
of a soccer stadium.

And it costs the budget of a small nation.
That world's fastest computer
is used to foresee long-term global warming.
And pinpoint the locations
of crude oil, injected water, and natural gas
that were flowing across
an oil producing field,
Such oil fields are up to 7.7 miles
(or 12.4 kilometers) deep,
or eight times the length of
the Second Niger Bridge
at Onitsha.
An oil field can be up to
twice the size of Anambra,
that is my state of origin
in my country of birth, Nigeria.

As I wove my emails
around my one binary million
email pathways, I discovered that
fastest computing across processors

brought depth and complexity
that took me a decade and a half
to fathom.
But everything came together
when the unknown became known
at 8:15 in the morning
of July 4, 1989, in Los Alamos,
New Mexico, USA.
And came together
when my answer
to the big question
which I first pondered on June 20, 1974,
in Corvallis, Oregon, USA,
became newspaper headlines.
It was mentioned in the June 20, 1990, issue
of *The Wall Street Journal*.

The reason my discovery
of the fastest computing
made the news headlines
was that it opened
the gate of knowledge

to the world's fastest computer
that's expected to become
the computer of tomorrow.

4 Philip Emeagwali Internet

My Discovery of the Fastest Computing Across Slowest Processors

First World's Fastest Computing Across an Internet

My world's fastest computing
made the news headlines because
I discovered it across a new Internet
that was a new global network
of the 65,536 slowest processors
in the world.
My discovery enabled
the large-scale computational physicist

to have a deeper understanding
of the most difficult problems
that arise
at the frontier of mathematical physics.
And understand physics
through large-scale experiments
executed on the world's biggest computers
that has the footprint of a football field.
I discovered
how to plumb the depths of physics.
And how to do so across a new Internet
that's a new global network of
off-the-shelf processors.
Those processors were identical
and equal distances apart.
To produce a scientific discovery
is to contribute to the
body of scientific knowledge.

Nine out of ten supercomputer cycles
are consumed by
large-scale computational physicists

who run codes
that were governed by laws of physics
and that were, first, encoded
into calculus and then reduced to algebra
and codes.
The supercomputer
is the scientist's best friend.

5 Contributions of Philip Emeagwali to Physics

People also ask:

"What did Philip Emeagwali
contribute to physics?"

My contributions to physics were these:

First, I discovered the world's fastest computing.

That contribution puts more computing
into the computer.
That new knowledge underpins
and increased the body of knowledge
of extreme-scale computational physics.
Second, I discovered
how to speed up the time-to-solution
of the world's most compute-intensive
problems
in computational physics.
Third, I discovered how to reduce
times-to-solution
from 65,536 computing-days,
180 computing-years, within one processor
to one supercomputing-day
across an ensemble of 65,536 processors.
In 1989, I was in the news because
I discovered how to reduce
180 computing-years
to one supercomputing-day.

Fourth, my discovery

of the world's fastest computing
is the reason for school essays
on Philip Emeagwali.
Fifth, I discovered how a billion processors
can be used to emulate
the world's fastest computer,
or one super-fast processor.
Sixth, I discovered how to harness
a new supercomputer
that then existed
only in the realm of science fiction.

Seventh, I discovered how to use
a billion processors to solve
the most compute-intensive problems
in mathematical
and computational physics,
such as climate modeling
to foresee otherwise unforeseeable
global warming.

My scientific discovery
is a contribution to mathematics
and physics
because that new knowledge
extended the frontier of knowledge
of mathematical physics.
And extended it by nine
partial differential equations,
called the Philip Emeagwali equations.

The Philip Emeagwali equations
governed the flows of crude oil,
injected water, and natural gas
that were flowing up to 7.7 miles
(or 12.4 kilometers) deep.
And flowing across an oil producing field
that's the size of Port Harcourt, Nigeria.
The Burgan sandstone oil field of Kuwait
could yield 72 billion barrels.

My invention

is a contribution to modern physics
because it was new knowledge
of how to solve a billion problems
of mathematical physics
and solve them at once.
That invention
extended the frontier of knowledge
of large-scale computational physics
and extended it by a factor of one billion.

The world's fastest computing
is my contribution to physics.
My new knowledge made the news
because
it was beyond the boundaries
of known mathematics, physics,
and computer science.
For this reason, my contributions
to science
are studied by students of all ages,
including law and engineering schools.

My quest for the new knowledge
of how to compute faster
and speedup 30,000 years
of time-to-solution
to one day
was my intellectual homecoming.
I had to leave my scientific home
that was physics, in 1970.
For the next twenty years,
I sojourned like a supercomputing
troubadour, or medieval lyric poet,
who invented equations
in the manner Bob Marley wrote songs.

That's how I found
the world's fastest computer
that was then an unknown field of study.

From a supercomputing perspective,
my contributions to physics were these:

I discovered extreme-scaled

computational physics across
my new Internet
that's a new global network of
65,536, or two-raised-to-power sixteen,
off-the-shelf processors
that shared nothing.
Each processor
operated its operating system.

To contribute to computational physics
demanded that I leave
the introductory physics
that I learned in Onitsha, Nigeria,
in the year 1970.
And learned after living in refugee camps
during the three preceding years.
During my twenty years
of full-time studies of mathematics,
physics, and computer science
that followed 1970,
I gained mathematical maturity
and a more profound and surer

understanding
of the laws of motion of physics
that were discovered three centuries
and three decades ago.

6 Why I Invented the Nine Philip Emeagwali Equations

Initial-boundary value problems
that are governed by a system of
partial differential equations
that encode a set of laws of physics
must be used to model phenomena,
such as those arising in fluid flows,
electrodynamics, electrostatics, elasticity,
heat, sound, and quantum mechanics.
As an aside, to invent
a partial differential equation
is not an easy task.

Most partial differential equations
were invented a century and half ago.
Only a dozen mathematicians
had invented important
partial differential equations
which were named after them.
Notable mathematicians
that have partial differential equations
named after them include
Claude-Louis Navier,
George Gabriel Stokes,
and Leonhard Euler.

Fluid dynamics
is the most important topic
in physics.
And is also my specialty
as a physicist.

The need to simulate

the internal dynamics of flowing fluids—
called the fluid dynamics—is the reason
ninety percent of the cycles
executed on the world's fastest computers
are consumed by physicists—called
computational fluid dynamicists.
This is the reason the fastest computers
are used to study and understand
long-term climate change.

The partial differential equation
is the natural dialect
of computational fluid dynamics.

The nine Philip Emeagwali equations
enabled me to see forces
that will be otherwise invisible.
And describe the motions of crude oil,
injected water, and natural gas
that will be otherwise indescribable.

For me, it was an epiphany
to realize that I had to leave
my old calculus textbooks behind
to discover my new calculus
for supercomputing.

My calculus is called
the nine Philip Emeagwali equations.

I discovered new calculus across
my new global network
of sixty-four binary thousand processors
that's my small Internet, *in reality.*
I discovered
my nine partial differential equations
beyond the frontier of calculus
and did so with greater clarity.

The discovery is a time machine
that takes us to the past
to see a thing that preexisted,
but that remained unseen

to our ancestors.

The invention enables us to create
the future of our descendants.

I'm Philip Emeagwali.

Thank you.

Further Listening and Rankings

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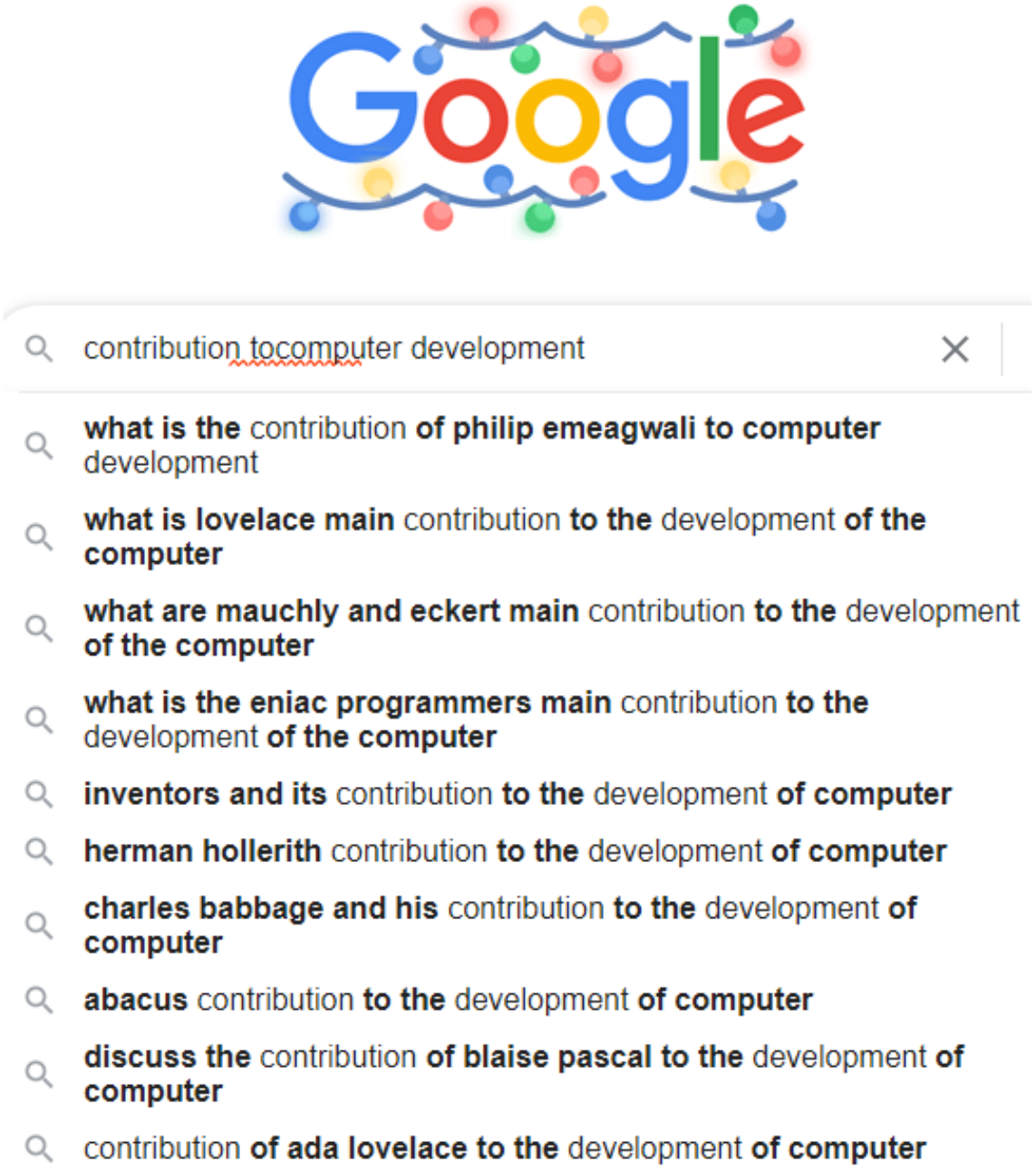
YouTube



Google suggests the greatest computer scientists of all times. With the number one spot, Philip Emeagwali is the most suggested computer pioneer for school biography reports across the USA, Canada, UK, and Africa (December 8, 2021).

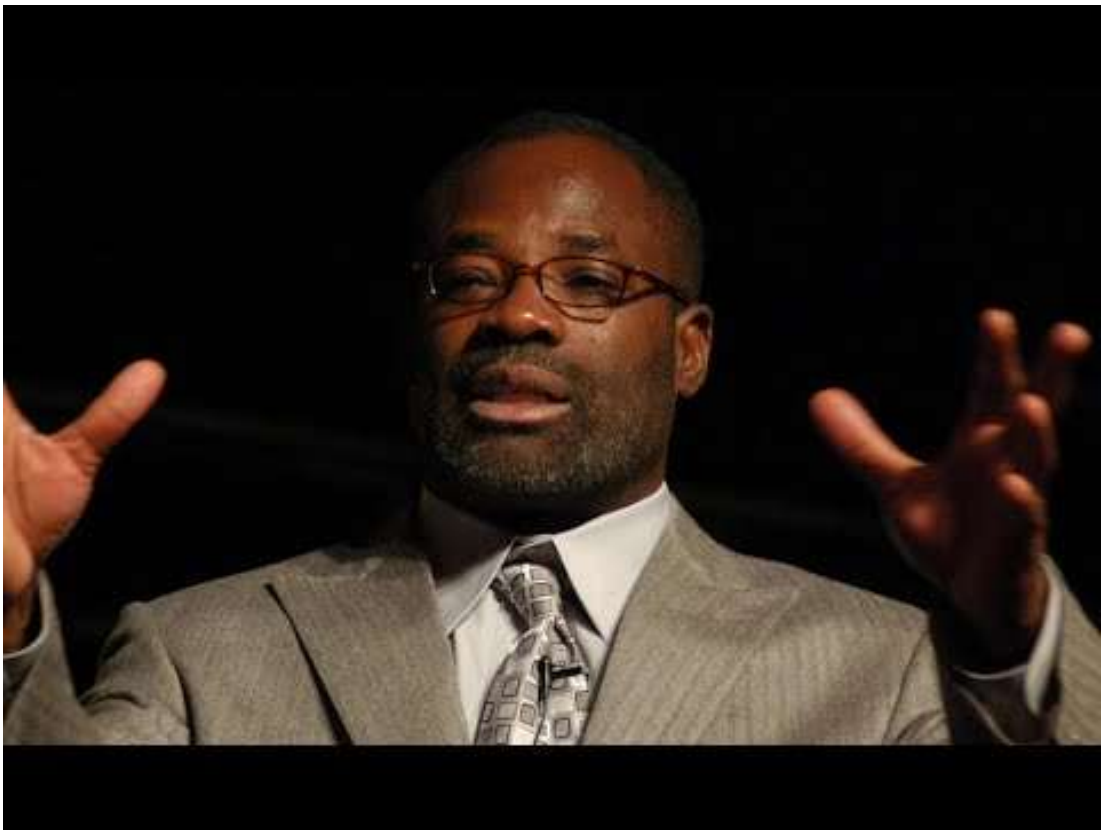
father of the internet

philip emeagwali father of the internet
tim berners lee father of the internet
vint cerf father of the internet
dr philip emeagwali father of the internet
leonard kleinrock father of the internet
nigerian father of the internet
bob kahn father of the internet
npr father of the internet
african father of the internet
father of the internet **al gore**

Google suggests the most noted fathers of the Internet. With four out of ten searches, Philip Emeagwali is the most suggested "father of the Internet" for schools across the USA, Canada, UK, and Africa (Labor Day 2019).

Philip Emeagwali
info@emeagwali.com 202-203-8724

4 A Refugee's Quest for the World's Fastest Computer



Philip Emeagwali

The Reader's Digest **described Philip Emeagwali as "smarter than Albert Einstein." Philip Emeagwali is often ranked as the world's greatest living genius and scientist. He is listed in the top 20 greatest minds that ever lived. That list includes Charles Darwin, Isaac Newton, William Shakespeare, Leonardo da Vinci, Aristotle, Pythagoras, and Confucius. Philip Emeagwali is studied in schools as a living historical figure.**

In 1989, Philip Emeagwali rose to fame when he won a recognition described as the Nobel Prize of Supercomputing and made the news headlines for his invention of the first world's fastest computing across an Internet that's a global network of processors. ***CNN*** **called him "A Father of the Internet."** ***House Beautiful*** **magazine ranked his invention among nine important everyday things taken for granted. In a White House speech of August 26, 2000, then U.S. President Bill Clinton described Philip Emeagwali as "one of the great minds of the Information Age."**

Watch the video at: https://youtu.be/UEwRHaSeBPQ

Transcript of Philip Emeagwali lecture 210930 2of3

- My Contribution to Computer Technology

  - The Epic Quest for the Holy Grail of Supercomputing

Thank you.

The biggest question
in computer science
is this:

"How can we use
the slowest processors in the world
to solve
the most compute-intensive
mathematical physics problems
in the world
and solve them
at the world's fastest computer speeds?"

I'm Philip Emeagwali

I invented how to solve
the most compute-intensive
mathematical physics problems
—called extreme-scale
computational fluid dynamics.

And solve them across a new Internet
that's a new global network of
up to one billion processors.
My contribution
to computational physics
made the news headlines in 1989.

Contribution of Nigeria in the History of Technology

A Black Mathematician in a White Space

I'm a Nigerian-born
who is studied in American schools.
In the U.S., I'm defined first
by my race
and second by my science.
In his book "The Souls of Black Folk,"
which was published in 1903,
the sociologist W.E.B. Du Bois

wrote that:

[quote]
"The problem of the twentieth century
is the problem of the color-line."
[unquote]

Seven decades later, I immigrated
from Nigeria to the USA.
And I experienced that color-line
as the fundamental problem
of American science.

I'm often asked:

"How much racism
is there in modern American science?"

The facts speak for themselves.
When I began programming
the fastest computers,
back on June 20, 1974, in Corvallis, Oregon,

USA, there was only one Black family
that owned a house in Corvallis,
a city of 36,000 persons.
And there were more Black Popes
than Black scientists listed
in the top one hundred
most outstanding scientists of all time.
In modern times and era of
gigantic supercomputers,
that each occupies the space of a soccer field
and cost a billion dollars each,
it is impossible
for a supercomputer scientist
to produce a breakthrough discovery alone.
To win the Nobel Prize of Supercomputing
demands hiring
a large team of research scientists.
And then taking the credit
for their collective contributions
to supercomputing.
It made the news headlines, in 1989,

that an African supercomputer genius
in the USA
that worked alone
has solved the most compute-intensive
mathematical problem
in physics.
And solved it alone.
I'm the Nigerian that was in the news,
back in 1989, for recording
the world's fastest speed in computing.
I have posted on YouTube
one thousand closed-captioned videos
in which I explained
how I solved that
compute-intensive problem.
Unlike my one-person
fastest computer of the 1980s,
the sequencing of the human genome
published in February 2001
was completed by two teams
of ten thousand (10,000) scientists.
Only a handful of those scientists

were Black, even though
the human genome
was analysed with the fastest computer
that originated from a black mind.
That lack of diversity in science
speaks volumes
about the blatant racism
that permeated
the American scientific world.
Black scientists were hampered
while struggling to contribute
to using the fastest computers
to cure new diseases,
create new drugs, and modify our DNA.
Supercomputers were used to study
the 3.1 billion pairs of DNA bases.
In 1989, I was in the news
for recording
3.1 billion mathematical calculations
per second.
And for winning the Nobel Prize
of Supercomputing.

As far as I know,
I was the only Black person
out of the 25,000
supercomputer scientists of the 1980s.
But had I been employed
as part of a thousand person
supercomputing team,
I would have been coerced
to become the lowest ranking member
of that research team.
The team leaders
would have made me their equivalent
of the hewer of wood and drawer of water.
As a one-person band,
I became the inventor
of a new supercomputer
that's a new Internet
that's the subject of essays
on famous inventors and their inventions.

The Nine Philip Emeagwali Equations

Singing a song
is a lesser contribution to music
than writing the same song.
You can't win the Grammy Award
for merely singing an old song.
Similarly, learning (or teaching) calculus
is zero contribution
to the existing body of
mathematical knowledge.
But contributing
new partial differential equations
to the twenty-first century
calculus—such as
the nine Philip Emeagwali equations—
and showing for the first time
how to use the slowest processors
in the world
to solve the most compute-intensive
problems

in the world, particularly, equations
that can arise
beyond the frontiers of calculus, algebra,
physics, and computing,
and recording the fastest computer speed
and doing so as the proof
of such an accomplishment,
was my contribution to science.
That contribution
made the news headlines, in 1989.
That discovery
is the reason I see twelve-year-olds
in U.S. public libraries
writing school essays on the contributions
of Philip Emeagwali to science.

Contributions of Nigeria to Mathematics

The young Nigerian mathematician
is inspired the most

when she watches on YouTube
one thousand video lectures
covering the contributions
of a Nigerian to mathematics, physics, and computer science.
My contributions to knowledge
range from
new algebra that redefined the boundaries
of the largest-scale algebra
in computational physics.
And new partial differential equations
that expanded twenty-first century calculus.
And new computational physics
that pushed the frontiers
of modern mathematical physics.
Parallel processing increases the speeds
of the fastest computer on a desktop
and in the world.

If you go to YouTube
and put in the following search terms:

"contributions of Americans
to mathematics"
or
"famous mathematicians"
or
"contributions of Americans
to physics"
or
"contributions of Americans
to computer science."

For those search terms,
and you will find that Nigeria
and Africa are now well represented.

It's difficult to inspire
a young Nigerian mathematician
to labor for the rest of his life
and do so to contribute
new partial differential equations
to twenty-first century calculus

and do so if he can't name
a Nigerian who also invented
new partial differential equations.
Because my contributions to mathematics
received media coverage,
I wasn't surprised to receive emails from
young Nigerian mathematicians
also undertaking to invent
new partial differential equations.
And invent them just like I did.

- How I Invented the World's Fastest Computing

My 1970s Years as a Supercomputer Scientist

Scientists become research scientists
by first becoming an apprentice scientist
and learning for ten years.

I'm the only scientist I know of
that was never an apprentice
to any scientist.

For me, Philip Emeagwali,
my supreme quest
for the fastest speed in computing
began on June 20, 1974,
at 1800 SW Campus Way, Corvallis, Oregon, USA.
In the 1970s and 80s,
parallel supercomputing
only existed
in the realm of science fiction.
The June 14, 1976, issue
of *Computer World*, a major publication,
carried an article that was titled:

"Research in Parallel Processing
Questioned as 'Waste of Time.'"

My 1980s Years as a Supercomputer Scientist

My technological quest was to discover
the parallel-processed
supercomputer solution
to the world's most
compute-intensive problems
in mathematics
and computer science.
And to harness the slowest processors
and use them to solve
the most compute-intensive problems
and solve such problems
at the fastest computer speeds.
I knew that I had arrived at my destination
when my scientific discovery
of the fastest computing
across the slowest processors

was in the June 20, 1990, issue
of *The Wall Street Journal*.

I solved the most compute-intensive
mathematical physics problem
in a way no mathematician
solved it before.

I knew that my breakthrough
was momentous because
I got phone calls
from the likes of Steve Jobs.
Steve Jobs was then heading
Pixar Animation Studios
and it was after they fired him
from his job as the CEO of Apple.
In 1986, or the year after he left Apple,
Steve Jobs
bought the computer graphics division
of Lucasfilm and renamed it

Pixar Animation Studios.
Steve Jobs wanted to know
if and how my breakthrough
of the fastest computer speed
across the slowest processors
can be used to reduce
the wall-clock time-to-solution
of image rendering software
that were executing
on his workstation computers,
then called NeXT.
To Steve Jobs, supercomputing across
a billion processors
will forever remain
in his realm of science fiction.
The June 10, 2008, issue
of The *New York Times*,
quoted Steve Jobs
as telling Apple's Worldwide Developers
that:

[And I quote]
"The way the processor industry is going is
to add more and more cores,
but nobody knows how
to program those things,"
[End of quote]

Steve Jobs continued:

[quote]
"I mean, two, yeah;
four, not really;
eight, forget it."
[unquote]

5,000 Authors of 5,000 Words

Some academic scientists

publish seventy papers a year.
A short physics paper
had 5,154 co-authors.
Twenty-four pages
of the 33-paged paper
were used to list the names
of its 5,154 co-authors.
Some of those co-authors
could merely have contributed
a comma or a period.
Each year, two-and-a-half million
scientific papers are published.
Fifty million scientific papers
were published in previous years.
The modern research scientist
is not focused on making a discovery.
But is on his quest
to write a scientific paper
that no scientist will likely read.
The scientific paper is nakedly void
of a contribution

that will make the news headlines.

Why Philip Emeagwali Stood Apart

The Emeagwali YouTube channel
has one thousand closed-captioned videos
on my contributions to science.
As an inventor who came of age
in the 1970s and 80s, I had little interaction
and zero collaboration
with other inventors.
I'm the only prominent scientist
of the 21st century
who stands solely
on his contributions to science.
That's in contrast to the contributions
of a diverse team
of up to one thousand multidisciplinary
and interdisciplinary teams
of applied mathematicians,

computational physicists,
and computer scientists.

I'm Well-Known But Not Known Well

In the 1980s, the decade I came of age,
they were about a thousand prizes
and awards in science.
In 1989, I won highest award
in supercomputing.
That recognition gave me credibility.
It's the reason I'm well-known,
but not known well.

For the twelve-year-old
to write an essay
on the contributions
of the most famous inventors
is to venerate, worship, adore,
and be in awe of those inventors'

contributions to society.
We venerate Albert Einstein
for his contributions to modern physics.
But your geometry teacher
will not be worshiped
for teaching you the Pythagoras theorem
of geometry—nor worshiped
like Pythagoras or like Euclid
who is the father of geometry.
But your algebra teacher
will not be worshiped
for teaching you the quadratic equation
of algebra—nor worshiped
like Muhammad ibn Musa al-Khwarizmi
who is the father of algebra.
Nor will a brilliant student
be held in awe
and profiled by historians of mathematics
for merely mastering how to solve
the initial-boundary value problem
of calculus and physics
that was governed by a system

of partial differential equations.
He will not be held in awe
for finally understanding
known mathematics
and computer science,
such as solving boundary value problems
on the fastest supercomputer
that was outlined and defined
and powered by up to
a billion processors.
That was my signature discovery
that I made on July 4, 1989.

Philip Emeagwali Internet

If my invention that was an ensemble
of processors
was represented by a phonograph record,
the fastest supercomputer in the world
will be the B-side of that record.
And the Internet

that's a global network of processors
will be its A-side.
On July 4, 1989, I discovered
how the slowest processing
across a new Internet
that was a new global network
of the slowest processors
could be harnessed.
And used to solve
compute-intensive problems.
In 1989, I expected the A-side
that is my Internet to be my chart hit.
However, the DJs (Disc Jockeys)
of the world of supercomputing
were mandated to recognize the
supercomputer, not the Internet.
The judges of the highest award
in supercomputing

quote, unquote "played"

only the B-side that represented

the new world's fastest computer.
That B-side won the most prestigious prize
in supercomputing and, later,
went on heavy rotation
and repositioned itself
as the new A-side
that everybody remembers.
So the earliest write-ups
on my invention focused on my
fastest supercomputer speed,
not on the machinery
which I used to achieve
that world-record speed.
That machinery was my new Internet
that was a new global network
of sixty-four binary thousand processors
(or, equivalently, 65,536 computers)
that were uniformly distributed across
the surface of a globe.
That new global network
of 65,536 processors
was my small copy of the Internet

that is also a global network of computers.
That new global network
of 65,536 computers
is called the Philip Emeagwali Internet.

- Breaking the Glass Ceiling for Blacks in Science

Why Black People Need to Stop Breaking the Glass Ceiling in Science

Where Are the Geniuses?

My contribution to the invention
of the first world's fastest computer
that computes with up to
one billion processors
was in the June 20, 1990, issue
of The *Wall Street Journal*
and in YouTube.
But the hardest part
about making that contribution

was that I was a marginalized
Black person
forced to repress his oppressed identity.
In 1989, I had to pretend I was white.
I hid my racial identity
to enable me to win the highest award
in supercomputing.
In the sixteen years before winning
that supercomputer prize,
I learned that the American academia
is a fortress.
I learned how to pretend to be white
which made it easier
for me penetrate that fortress
and win the highest award in
supercomputing.

The most prominent scientists, including
William Shockley and James Watson, are
the most likely
to hold the belief I was less intelligent
than Albert Einstein.

Shortly after I discovered
fastest computing arising from
slowest processing,
prominent supercomputer scientists
who didn't know that I was Black
wrote that
I was a supercomputer genius.
That was when
I became ranked with the likes of Galileo,
Isaac Newton, and Albert Einstein.
And how I later appeared on
two postage stamps.

An Unknown Black Genius Among White Geniuses

In 1974, the year I began programming
the fastest computers,
I was in Corvallis, Oregon, USA.
The field of computer science

was then nearly as white as a
posh country club of the 1950s Alabama.
As a Black supercomputer scientist
giving a lecture
to white research mathematicians
and doing so in the early 1980s,
those mathematicians were taken aback
at my command of scientific materials.
They were surprised that
I was teaching them
how to solve
my new system of coupled, nonlinear,
and time-dependent
partial differential equations
that arise beyond the frontier of calculus.
And that govern
initial-boundary value problems of physics.
The poster girl of such problems
is the three-phased flows of crude oil,
injected water, and natural gas
that were flowing along
three spatial dimensions.

And flowing across porous media
that were both heterogeneous
and anisotropic. In 1989,
I was in the news because
I was the first mathematician
to figure out how to solve
the most compute-intensive problems.
And how to solve them across
up to one billion processors.
In the early 1980s,
many white mathematicians
had a lower expectation for me.
Their lower expectations
arose from their ingrained belief
that a Black research mathematician
lacks the intellect of Albert Einstein.
White mathematicians presumed that
a high IQ, or intelligence quotient,
is the precondition
for solving the most difficult problems
at the frontiers of knowledge
where new physics, new mathematics,

and fastest computing intersect.

As the first Black person
to win a scientific award
that was compared to the Nobel Prize,
and do so in 1989, and as the only person,
Black or white,
to win that prize alone

I was devoured like a lamb
and my garments were soiled
in mockery.

I survived vicious criticisms
that were full of bitterness and hate.
And I have the scars to prove them.
The world's fastest computer speed
which I recorded across my ensemble
of the slowest 65,536 processors
in the world
and which I discovered
on the Fourth of July 1989

made the news headlines because
it was a milestone in computer history.

A Milestone in Computer History

That milestone marked the beginning
of the most powerful supercomputer
that's powered by millions of processors
that shared nothing.
I was the only person who figured out
how to harness those separate,
but coupled, processors.
And how to harness them
as one seamless, coherent, and gigantic
supercomputer
which can be used to solve
the most compute-intensive problems
in mathematics, science,
and engineering.
I figured out how to use

up to one billion processors
to solve compute-intensive problems
that will arise in mathematics, physics,
and computer science.
The reason my contribution
to computer science is studied in schools
is that fastest computing across
ordinary processors
has withstood the test of time.

Writing the history of the supercomputer
that processes across processors
and writing it without crediting
the person who first discovered
fastest computing
is like producing the play Hamlet
without the Prince of Denmark.

Resentments Flared After I Won the Highest Award in Supercomputing

In 1989
and after I won the highest award
in supercomputing,
I became sought after
by the news media.
And hate groups openly resented
that a young Black sub-Saharan African
has become the public face and pioneer
of the new computer science
that's defined across
a million processors.
The typical newspaper headline
was this:

"African Supercomputer Genius
Wins Top U.S. Prize."

Some sympathizers of hate groups
within the scientific research community
reacted negatively to my success
in discovering

that the fastest computer
can be built with the slowest processors
and across an Internet
that's a global network of those
processors.
They did so by blackmailing me
and by sabotaging
my supercomputer research.
And by trying assiduously
to destroy my reputation.
They protested when I was ranked
the greatest computer genius
that ever lived.
And they tried to prove that
I wasn't a genius. Towards that end,
they made strenuous efforts
to water down my contribution
to the development of the computer.
In 1989, I was blackmailed and coerced
to agree to share the credit
for my invention
of the fastest computing across

the slowest processors.
The scientific community in Ann Arbor (Michigan)
blackmailed me because
I refused to share the credit
for my supercomputer discovery
of how to solve
the most compute-intensive problems.
I was in the news because
I discovered how to solve
the most compute-intensive problems
in computer science and physics.
And how to solve them across
a new Internet
that's a new global network of
up to one billion processors.

- Why Few Africans Reach the Top of Technology

Fighting Institutional Racism

A newspaper reporter said that
he was threatened and warned
not to publicize my discovery
of fastest computing.
White reporters dropped my story
after discovering that I was Black.
Yet, it was ironic that those
white mathematicians
who complained the loudest
never published a joint mathematical paper
with a Black mathematician
as their co-author.
As a Black mathematician
who came of age in the 1970s
in Corvallis (Oregon)
and early 80s in College Park (Maryland),
my access to vector supercomputers
that were owned and operated
by the U.S. government

were revoked
after the supercomputer administrators
discovered that I was Black
and of sub-Saharan African ancestry.
I was banned from programming
the vector supercomputer
that was owned by the U.S.
National Science Foundation
and located in San Diego, California.
I was also banned from programming
the vector supercomputer
that was owned by the U.S.
National Weather Service
and located in Camp Springs, Maryland.
Yet, I was compelled to pay taxes
even though
I couldn't use the forty million dollars
vector supercomputers
that were bought with my Black tax dollars.
It's called the "Black tax"
and is the reason Blacks

are under-represented
at the frontiers of mathematical research.

Seymour Cray was the thought leader
in the vector supercomputer world
of the 1970s and 80s.
Over a thousand scientists
assisted Seymour Cray in co-developing
his vector supercomputers.
Seymour Cray received billions of dollars
in U.S. governmental patronage.
Nevertheless, Seymour Cray believed that
parallel supercomputing
will forever remain
in the realm of science fiction.
In contrast, I wasn't assisted
by any supercomputer scientist.
And I wasn't given any money.
Nevertheless, I was the only person
that made the news headlines
for discovering
the world's fastest computer speed

across the slowest processors in the world.

My contribution to computer science is this:

I discovered
how to turn a supercomputer technology
that was mocked as controversial,
ridiculed, and dismissed
as science fiction
and make it the reality
that is now the
world's fastest computer.
In the world of the fastest computers, I,
not Seymour Cray, was person zero
and the lightning rod
that changed the way
we look at computing across
millions of processors.

Backlash from My Fame

I'm a large-scale computational
fluid dynamics engineer.
I was the first person
to understand how millions of processors
should be used to solve
the most compute-intensive problems.
And solve the world's most important
and complex challenges
in mathematics, science,
and engineering.
Since 1989, I was lampooned
by white nationalists
who spread the misunderstanding
that I knew less than
the likes of Albert Einstein.
Their lies were disproved by physicists
who watched my physics lectures
that were posted on YouTube.
Once I achieved fame, in 1989,

I became a threat to white supremacists
who strove to diminish my contributions
to developing the fastest computers.
Their personal attack on me
was sponsored and orchestrated.
Some jobless Nigerians in Nigeria
confessed they were paid
to publish negative information
that should prove that
I'm not as intelligent as Albert Einstein.
After my news headlines of 1989,
I became the new Antichrist
of the world of
predominantly white science.
It was my invention
of the world's fastest computing
that provoked the negative backlash
against me.

An inventor who didn't receive
a negative backlash,

didn't make a ground-breaking invention
that changed the way
the world of technology looked at things.

After my scientific discovery,
of fastest computing
across millions of processors,
which occurred on the Fourth of July 1989,
I was repeatedly attacked.
I was attacked for the same reasons
the soccer striker
who is his team's scoring threat
is always drawing the attention
of three terrorized defenders.
I was attacked because
fastest computing across
the slowest processors
was a fundamental change
and a strategic technology.
So denying a Black inventor
the credit for inventing
supercomputing across ordinary

processors
prevents him from getting on the list of
famous inventors and their inventions.
For example,
the Emeagwali Supercomputer
was renamed to something generic.
It was renamed to deny credit
to its Black inventor
who was born in sub-Saharan Africa.
Before my invention, which occurred
on July 4, 1989, I wasn't a threat
to white supremacists.
And I wasn't publicly attacked by them.
That was the reason, I *de facto* became
the defrocked priest of supercomputing
deprived the right
to invent a new supercomputer
that's a new Internet.
And without a supercomputer,
I became like a boy without his favorite toy.

How Supercomputing Emerged from Science Fiction

Before 1946,
the programmable computer existed
only in the realm of science fiction.
Before July 4, 1989,
the knowledge of how to program
an ensemble of a billion
coupled processors
and how to program them
to work together
as one seamless, coherent supercomputer
that can solve
the most compute-intensive problems
only existed in the realm of science fiction.

The June 14, 1976, issue
of the influential magazine,
Computer World,
published an article that was titled:

[quote]
"Research in Parallel Processing
Questioned as 'Waste of Time.'"
[unquote]

So, it came as a surprise
to vector supercomputer scientists
when I announced that I've discovered
how an ensemble of the slowest
processors can be used to solve
the most compute-intensive problems
and record the fastest speeds
in supercomputing.
My discovery meant that
parallel processing wasn't a waste of time.
I invented parallel supercomputing,
on July 4, 1989,
in Los Alamos, New Mexico, USA.

My Visions of Computing in Year Million

Our prehuman ancestors
of one million years ago
weren't humans.
Therefore, our posthuman Gods
of Year Million
could be cyborgs—or part intelligent matter
and part human.
Our posthuman Gods
could be both the creator and the created
and might acknowledge us
as their co-creators.

- Where Are the Black Geniuses?

Why We Should No Longer Accept Being the "First Black Genius"

- Breaking Racial Barriers

I was the first person
of African descent
to break the racial barrier
that was at the crossroad
and at the frontiers of mathematics,
physics, and computer science.
For that reason, I was the first
lone investigator
to win the highest award
in supercomputing.
I stood out because I won that prize alone.
Other co-winners did so
as part of a diverse, talented,
multi-institutional, and interdisciplinary

research team
of up to fifty co-winners.
I won that prize alone because
I entered deep into
and beyond the frontiers of science.
I'm often cross-listed
and studied in American schools
with famous scientists, such as
Galileo Galilei, Isaac Newton,
and Albert Einstein.

But at first and in 1989,
I wasn't accepted
as other famous scientists
who were white.
The earliest news headlines
about my invention of fastest computing
drew the anger of white supremacists,
especially those within academia.

Reliving 1940s American Racism in the 1970s

In 1989, I was in the news.
Unknown to me, I had broken
a color barrier.
And did so by winning an award
that computer scientists referred to
as the Nobel Prize of Supercomputing.
That attention drew jealousy.

As a Black inventor
who came of age in the 1970s,
I relived the racism
Jackie Robinson experienced
three decades earlier.
And for breaking the color barrier
in baseball.
Nine years earlier,
Jesse Owens was scorned
by Adolf Hitler for breaking

three world records
and earning the title
"The World's Fastest Human."
On July 4, 1989, I broke the world record
in computer speed.
For that reason, some called me
"One of the World's Fastest Humans."
But I was fastest in calculations,
not in track and field.
But I broke the speed record
not with the world's fastest
supercomputer, as expected.
But across the slowest processors
in the world.
My contribution to computer science
made the news because
it was then impossible to use
a million processors
to solve the most compute-intensive
problems
in mathematics and physics.
Here we are, I said to myself, its 1989,

and I was getting the Jackie Robinson treatment.
And getting as many cold shoulders
as Jackie Robinson received
in 1945.
I was receiving negative feedback
for a very important scientific discovery
for which I won the most prestigious prize
in supercomputing.
That negative feedback occurred because
white scientists discovered that
I'm Black.
And born in Nigeria.
For that reason, they stopped giving me
the top awards in science, even though
I was the living scientist
that's the most mentioned in school
essays.

Who is a Genius?

In an email, a thirteen-year-old
writing an essay on great mathematicians
and their contributions to mathematics
asked me:

"Are you a Black genius?"

The genius is the ordinary person
that found the extraordinary
in the ordinary.
If you can see something
that I can't see
and that thing does not exist,
then you're not a genius.
But if I see something
that you can't see
and that thing exists,
then I'm a genius.

A Genius Must Put Time-in-Grade

To be called a genius does not mean
you must know everything
in mathematics, physics,
and computer science.
The genius who solves
the most difficult problem
in supercomputing must,
foremost, put in his time-in-grade
in his studies of calculus, algebra, physics,
and computing.
That genius must know a lot about
the partial differential equation.
And do so because
such equations are the most important
in the world of science.
The partial differential equation
is the most recurring decimal
in supercomputing.

One in a Million Mathematicians

In the 1980s,
only one in a million mathematicians
possessed the mathematical maturity
that was needed to harness
up to a billion processors
that shared nothing. That mathematician
must be able to use
a global network of processors
and use them to solve
the most compute-intensive problems.
In 1974, I visualized that global network
as my new Internet.
My research quest was to discover
how I must harness a billion processors
and do so in their totality.
And use those processors to solve
my discretized system
of partial differential equations

of calculus, or instead, my newly derived
partial difference equations
of computational linear algebra,
that must be used to simulate
global warming
that otherwise would be impossible
to simulate.
I know how to solve
this difficult problem because
I was the first mathematician
who solved it.
I was the first mathematician
to solve a Grand Challenge Problem.
And solve it across a then world-record
ensemble of 65,536 processors.
I pictured my processors
as encircling a globe.
And doing so just as
computers encircle the Earth.
My contribution to the invention
of the first world's fastest computer,
as it's known today,

made the news headlines.
I was described as the genius in the USA
who won the highest award
in supercomputing.
And did so for solving
the Grand Challenge Problem
of mathematics
and solving it on July 4, 1989
in Los Alamos, New Mexico, USA.
For this reason, it should come as a surprise
that I'm the only research mathematician
or physicist or computer scientist
who shared one thousand closed-captioned videos
on YouTube.
If you do a YouTube search
on contributions to mathematics, physics,
and computer science,
you will see that the name
Philip Emeagwali
is the most recurring decimal.

Struggles as a Black Inventor

I'm a computer scientist
who came of age in the 1970s.
Since June 20, 1974, in Corvallis, Oregon,
USA, I was searching for
new equations that's never been scribbled
on any blackboard.
And searching for new physics
that's outside the textbook.
And searching for
the world's fastest computer.
Towards that quest,
I flaunted my uncompromising theories,
such as sending and receiving
emailed codes.
And sending them across
a new Internet
that's a new supercomputer

and that's a global network of processors.
As my act of protest
against the racism that I experienced,
I pursued a controversial way
of the first supercomputing
across the world's slowest computers.
Due to that controversy,
my discovery of fastest computing
was rejected in November 1982
and September 1983.
In the early 1980s, I expected my discovery
to be always rejected.

Seven years later, and in 1989,
rather than bringing me more ridicules
and rejections, my invention
of the first supercomputing
across the world's slowest computers
propelled me
to the front pages of newspapers
and science publications.

The Importance of Supercomputers

My solutions
of the most compute-intensive problems
were reimagined across
one billion processors.
And rethought
for the waves of transformations
in the 21st century.
Today, every supercomputing
is harnessing parallel processing
as the transformative technology
that offers quantum speedup
and breakthroughs
in computational fluid dynamics.
The supercomputer is the transformative
and enabling technology
that must be used
to recover crude oil and natural gas
that were buried up to 7.7 miles

(or 12.4 kilometers) deep
and inside an oil producing field
that's up to twice the size
of the state of Anambra, Nigeria.
The fastest supercomputer
is the critical technology
that must be used
to forecast long-term global warming
across the centuries.

In an email, a twelve-year-old
writing a school essay asked:

"What's the contribution
of Philip Emeagwali
to the development
of the fastest computer?"

In 1989, I was in the news
for discovering that
the slowest processors
could be used

to solve the biggest problems.
And find their answers at the fastest speeds.
The fastest computer
is why you know the weather
before going outside.

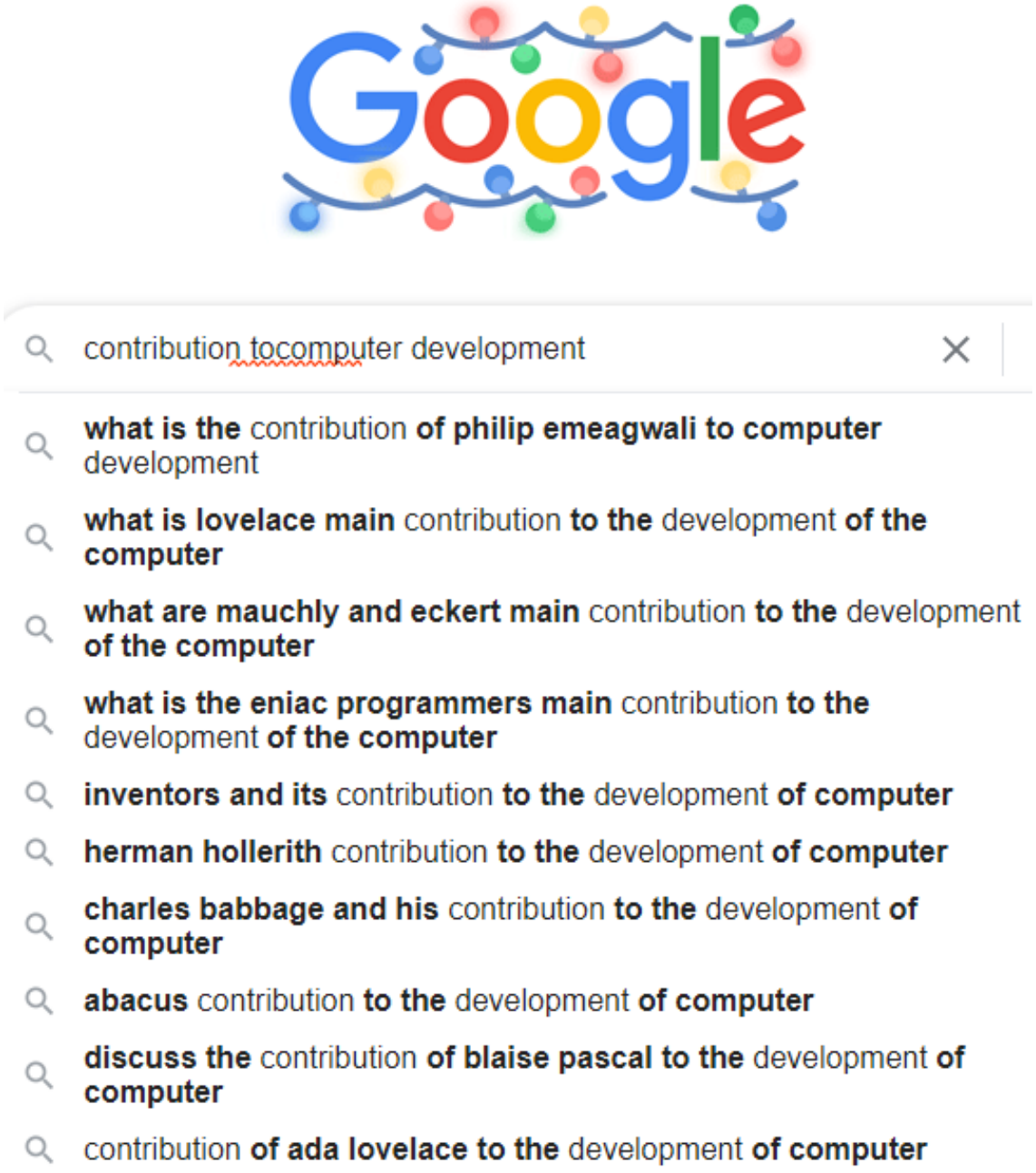
Thank you.

I'm Philip Emeagwali.

Further Listening and Rankings

Search and listen to Philip Emeagwali in

Apple Podcasts
Google Podcasts
Spotify
Audible
YouTube



Google suggests the greatest computer scientists of all times. With the number one spot, Philip Emeagwali is the most suggested computer pioneer for school biography reports across the USA, Canada, UK, and Africa (December 8, 2021).

father of the internet

philip emeagwali father of the internet
tim berners lee father of the internet
vint cerf father of the internet
dr philip emeagwali father of the internet
leonard kleinrock father of the internet
nigerian father of the internet
bob kahn father of the internet
npr father of the internet
african father of the internet
father of the internet **al gore**

Google suggests the most noted fathers of the Internet. With four out of ten searches, Philip Emeagwali is the most suggested "father of the Internet" for schools across the USA, Canada, UK, and Africa (Labor Day 2019).

Philip Emeagwali
info@emeagwali.com 202-203-8724

Philip Emeagwali Supercomputing Combined Processors to Develop the World's Fastest Computer

Transcript of Philip Emeagwali YouTube lecture 210930-3of3 for the video posted below.

Click below to watch Philip Emeagwali on YouTube.com

https://youtu.be/cvzCgpJ_VD8

Philip Emeagwali

The Reader's Digest **described Philip Emeagwali as "smarter than Albert Einstein." Philip Emeagwali is often ranked as the world's greatest living genius and scientist. He is listed in the top 20 greatest minds that ever lived. That list includes Charles Darwin, Isaac Newton, William Shakespeare, Leonardo da Vinci, Aristotle, Pythagoras, and Confucius. Philip Emeagwali is studied in schools as a living historical figure.**

In 1989, Philip Emeagwali rose to fame when he won a recognition described as the Nobel Prize of Supercomputing and made the news headlines for his invention of the first world's fastest computing across an Internet that's a global network of processors. ***CNN*** **called him**

"A Father of the Internet." *House Beautiful* magazine ranked his invention among nine important everyday things taken for granted. In a White House speech of August 26, 2000, then U.S. President Bill Clinton described Philip Emeagwali as "one of the great minds of the Information Age."

1 How I Invented the Philip Emeagwali Internet

How I Discovered a New Internet

What is Philip Emeagwali Noted For?

Thank you.

A fourteen-year-old writing
a short biography
on the contributions of Philip Emeagwali to mathematics asked:

"What is Philip Emeagwali noted for?"

In 1989, I was in the news because

I discovered how to solve
initial-boundary value problems.
Such difficult calculus problems
are central to extreme-scale
computational physics.
That mathematical physics problem
was previously impossible to solve
on conventional supercomputers
that were powered by
only one powerful processor.
To be specific, I was in the news because
I discovered how to divide
a compute-intensive,
or grand challenge, problem
into up to a billion
lesser challenging problems.
I discovered how to solve
the hardest problems
in computational mathematics and physics.
And solve them
as many times faster
as they were processors.

And across as many coupled processors
that outline and define
the world's fastest computers.
To be more specific, I discovered
how a higher-fidelity
petroleum reservoir simulation
can be extracted from
sixty-four binary thousand
lesser compute-intensive simulations
which I executed
with a one-to-one correspondence
across as many processors.

> How to Solve the Philip Emeagwali Equations

Along my way to the farthest frontiers
of mathematical knowledge,
I invented a system of coupled, nonlinear,
time-dependent, and state-of-the-art
partial differential equations

that's the most challenging one
beyond the frontier of calculus.
It's known as
the nine Philip Emeagwali equations.
On the mathematician's blackboard,
the Philip Emeagwali equations
are as long as your arms.

I invented how to solve
the most compute-intensive
mathematical physics problems,
called extreme-scale
computational fluid dynamics.
And solve them across my new Internet
that's a new global network
of up to one billion processors.
My processors were identical
and coupled to each other.
Each processor
operated its operating system

and had its dedicated memory
that shared nothing,
but were in dialogue with each other.

Inventing the World's Fastest Computer

The reason it took me sixteen years
to discover that
the slowest processors could be used
to produce the fastest supercomputers
was that my first sixteen years
of supercomputer research
were a record of failures and rejections.
To invent
is to make the unimaginable possible.
To invent a new computer
is to make the impossible
speed in computing possible.

On July 4, 1989,

I recorded a computer speed
that was considered impossible to record.
I recorded the world's fastest
computer speed
that was mentioned
in the June 20, 1990, issue
of *The Wall Street Journal*.

In high-performance computing,
it's difficult to show that
impossible speeds are possible.
I was the first person to prove that
fastest computing across
slowest processors
wasn't merely a beautiful theory.
I provided the experimental confirmation
that elevated
fastest computing across processors
from science fiction
to computer science textbooks.
My struggle to invent
a new supercomputer,

such as a new global network
of the slowest processors in the world
that's a new computer
and a new Internet, must be preceded
by a series of failures and rejections.

Contributions of Philip Emeagwali to Mathematical Physics

A twelve-year-old writing a short essay
on the contributions of Philip Emeagwali
to computer science
did not understand that I contributed
to both physics and mathematics.
It's often forgotten that
I'm a person who contributed
new mathematical knowledge.
For those reasons, I was the cover story
of the May 1990 issue of the *SIAM News*.
The *SIAM News*

is the flagship publication
for the top minds in mathematics.
The *SIAM News* is mailed to
the Who's Whos
in the world of mathematics.

As a dense and abstract subject,
mathematics exists at the margins
of popular science.
I existed at the margins of thought.

We see calculus from the bright light
of popular technology.
Albert Einstein
—who theoretically discovered
The Theory of Relativity—
is better known than Gottfried Leibnitz—
who contributed to developing calculus.
In engineering and society,
calculus is more important than relativity.
My goal was to find a balance

between physics, calculus, and computing.
I pictured myself
as a supercomputing-gymnast
standing on his balance beam.
The challenge was for me to stand
within the narrow approximations
from
my algebraic approximations
of my system of
partial differential equations
that I invented and used to codify
a set of laws of physics.
To approximate the wrong set of laws
of physics,
whether intentional or unintentional,
is akin to the gymnast losing her footing.

Contributions of Philip Emeagwali to Computer Science

People often ask:

"What is the contribution
of Philip Emeagwali
to computer science?"

I was searching for the fastest computer, ever.
I was searching for the then-unseen supercomputer that's a new Internet.
I was searching for
how to compute faster.
And do so by a factor of
sixty-four binary thousand,
or two-raised-to-power sixteen.
After sixteen years of searching
for the world's fastest computer,
I discovered how to compress
the time-to-solution
of the most compute-intensive problems
in science and medicine.
I discovered

how to compress time-to-solution
and compress it by a factor of
65,536. I discovered
how to compress 180
supercomputing-years,
or sixty-four binary thousand
computing-days,
to merely one supercomputing-day.
On July 4, 1989, I became the first person
to execute the first supercomputing,
as it's executed today.
It was with an improved
cost-performance ratio
that's the precursor
to the world's fastest computers
which were powered by millions
of self-contained off-the-shelf processors
sharing nothing.
That was my signature contribution
to mathematics, physics,
and computer science.
And the reason I am the subject of

inventor biography essays
across schools in the USA, Canada,
and Europe.
My discovery that the fastest computing
can occur across
the slowest processors
made the news.
It was easy to quantify and measure
my contribution to mathematics
and physics.

2 Inventing the World's Fastest Computer

Where is Philip Emeagwali?

People also ask:

"Where is Philip Emeagwali?"

I left Corvallis, Oregon,

on Sunday, June 5, 1977.
My last day in Oregon
was the day the Apple II,
an eight-bit home computer,
went on sale.
In 1977, the Apple II was sold for
the not-so-inexpensive
base price of one thousand
two hundred and ninety-eight dollars
[$1298] dollars.

"So, where is Philip Emeagwali?"

I discovered
that the fastest computer
can be built with the slowest processors
and did so on July 4, 1989
in Los Alamos, New Mexico, USA.
I was last in Los Alamos, New Mexico
on March 21, 1991.

I'm in the beautiful upstate of New York
where my wife and I
experience all the four seasons.
We cross country ski. Hike and bike
around scenic parks
from Saratoga Springs to Lake George.
And go to farmers' markets.
Interesting places within driving distances
include the village of Lake Placid
which is one of the six forgotten
vacation spots in North America
and Martha's Vineyard.

Struggles to Invent the World's Fastest Computer

During the sixteen years
that followed June 20, 1974,
in Corvallis, Oregon, USA, I struggled
to discover that
the world's fastest computing
can be executed across an internet

that's a global network
of the world's slowest processors.
A proverb of my ancestral
Igbo-speaking people
of the south-eastern region of Nigeria
is this:

"The bush fowl of a village
cries in the dialect of its village."

In the village of vector supercomputing
of the 1970s and 80s, I was the bush fowl
that cried in the dialect
of the different mathematical village
known as fastest computing across
processors that shared nothing.
That scientific village
was the unknown field of knowledge,
or the controversial technology,
that was then mocked, ridiculed,
and rejected

as a tremendous waste of everybody's time.

Quest for the World's Fastest Computer

My quest for the world's fastest computer
that's powered by up to a billion processors
began on June 20, 1974
at 1800 SW Campus Way,
Corvallis, Oregon.
I began on a supercomputer
that was previously rated
as the world's fastest computer.
My quest
was to be the first person
to understand
how to harness the slowest processors.
And how to use up to a billion processors to solve
the most compute-intensive problems
and solve them at the fastest possible

speeds.
That was how I discovered
how and why parallel processing
makes the world's fastest computers
fastest.
I discovered how to harness
the slowest processors
that were within the bowels
of the world's fastest computers.
I made that supercomputing discovery
at 8:15 in the morning
of July 4, 1989.
My invention is studied in schools
as a milestone
in computer history.
My supercomputer breakthrough
made the news headlines
and was mentioned
in the June 20, 1990, issue
of *The Wall Street Journal*.

Why Mathematics and Physics Are Central in Supercomputing

During my quest
for the world's fastest computer,
I found my center of gravity
on the unorthodox ensemble
of the slowest 65,536 processors
in the world. And found it
when everybody swore that
fastest computing across
slowest processors
will forever remain
an enormous waste of everybody's time.
I found that center of gravity
at the frontier of knowledge
of the laws of physics
as applied to large-scale
computational physics.
I found that center of gravity
beyond the frontier of knowledge

of the partial differential equation
that is beyond the frontier of calculus
and mathematical physics.
Likewise, I found that center of gravity
beyond the frontier of knowledge
of the system of linear equations
of modern algebra.
And I found that center of gravity
beyond the frontier of knowledge
of the most compute-intensive
floating-point operations
in fastest recorded arithmetic.
Furthermore, I invented how to execute
the largest set of
floating-point operations
in arithmetic.
Such calculations approximated
the solutions of the largest-scale
system of equations of modern algebra.
Such algebra originated
as discrete approximations
of a system of coupled, nonlinear,

time-dependent, and state-of-the-art
partial differential equations
that's the most challenging problem
arising beyond the frontier of calculus.
And that are known as
the Philip Emeagwali's equations.
My equations encoded
a set of laws of physics
that governs the flows of crude oil,
injected water, and natural gas
that were flowing up to 7.7 miles
(or 12.4 kilometers) deep.
And flowing across an oil producing field
that's often the size of Accra, Ghana.
For such multidisciplinary
compute-intensive problems,
my scientific quest for the discovery
of the world's fastest computing
across an internet
that's a global network of processors
traversed across
the frontiers of knowledge

of computational physics, modern calculus, large-scale algebra, fastest computation, and email communication.

3 Father of the Internet | How I Visualized the Philip Emeagwali Internet

Like threads through a tapestry
that intersected and then diverged,
my discovery traversed
the frontiers of knowledge
of mathematics, physics,
and computer science.

I discovered that
the world's fastest computer
must always be powered by
up to a billion processors.
Those processors compute, in tandem,
to solve the most compute-intensive

problems
in mathematics and physics.
And communicate their answers
in synchrony.
And do both across an internet
that's an instrument of
large-scale computational physics.
In Corvallis, Oregon, USA,
and on June 20 1974,
that Internet was like a dim light in the sky.
But on July 4, 1989,
and in Los Alamos, New Mexico, USA,
I discovered that Internet
to be the world's fastest computer
that was shining like a beautiful star
in a dark galaxy.
After sixteen years of fastest computing,
that followed June 20, 1974,
I discovered that
I was standing alone and at the crossroad
of the frontiers of human knowledge.
Furthermore, I discovered that

I was sitting in front of a new Internet
that I—its sole programmer—visualized
as my world's fastest computer
that is powered by
the world's slowest 65,536 processors.
I visualized that fastest
computing machinery
as my new spherical island
of sixty-four binary thousand processors.
Or two-raised-to-power sixteen
off-the-shelf processors.
Likewise, I visualized my processors
as separated equal distances apart,
and separated with each processor
placed on the fifteen-dimensional
hypersurface
of a globe that's a hypersphere.
Not only that, I visualized that globe
as embedded
within a sixteen-dimensional hyperspace.

What is Philip Emeagwali known for?

I discovered
how to combine computers
into a supercomputer
that's an Internet.
That discovery is like a light
from an ancient sky.
I'm the only father of the Internet
that invented an Internet.

4 Inventing the World's Fastest Computer

My Journey from Computer to Supercomputer

School Essays on Philip Emeagwali

The new supercomputer
that I visualized in a sixteen-dimensional

hyperspace
was previously not understood
as a supercomputer
in our everyday three-dimensional
universe.
The one-processor supercomputing
is zero-dimensional.
That's the reason fifth graders
are writing essays on Philip Emeagwali
and on his contributions
to developing the world's fastest computer.
And as one of the
fathers of the Internet.
To be the subject of school essays
who is studied with Albert Einstein,
Nikola Tesla, and Pythagoras
is like being listed
in a forever bestseller list.
And being cross listed in school curricula
with Isaac Newton, Charles Darwin,
and William Shakespeare.
School essay assignments

are the reasons I have a constant audience
of children and young adults, as well as
their teachers and parents.
Being in the school syllabus
is like having a built-in audience
of students and teachers.
At Emeagwali DoT CoM,
we posted teachers' guides,
discussion questions,
and educational activities.
We also posted
audiotaped and videotaped
interviews and lectures,
with links to one thousand podcasts
and YouTube videos.
For over a century,
school districts across North America
and Europe assigned a quote, unquote
"Stories About Scientists"
as essay assignments.
Since 1989, school children
were asked to write an essay titled:

"The Contributions of
Philip Emeagwali
to the Development of the Computer."

An adage of my ancestral Igbo people of the southeastern region of Nigeria states that:

"The chicken does not lay its egg
and hatch it the next day."

I conceived my first world's fastest computing across my Internet, back on June 20, 1974,
in Corvallis, Oregon, USA.
But it took me fifteen years
to hatch it on July 4, 1989, in Los Alamos, New Mexico, USA.
And for my world's fastest computing to be mentioned in the June 20, 1990 issue of *The Wall Street Journal*.

To school children with no knowledge
of my origin story, of 1974,
it will seem like I entered
into their Core Knowledge Series
overnight.
And entered via textbooks
like the one titled:

"History of the Internet."

5 Inventing the World's Fastest Computing Across an Internet

I discovered the world's fastest computing,
on July 4, 1989,
in Los Alamos, New Mexico, USA.
I invented the fastest computing
across the slowest processors.
And invented it after years of computing
with the slowest sixty-four binary
thousand,

or two-raised-to-power sixteen,
off-the-shelf processors.
And invented it for solving
the hardest problems
in physics, such as
large-scale computational fluid dynamics
that must be used to predict
how COVID-19 spreads
across New York City trains
that pack passengers like sardines.

In 1989,
I was in the news because
I discovered the fastest computing
across the slowest processors.
I invented the technology
when mathematicians believed that
the first world's fastest computing across
the world's slowest processors
was a beautiful theory that requires
further experimental confirmation.

Fastest Computing Across an Internet

I discovered the world's fastest computing
and did so across an Internet.
I visualized that new Internet
as my new global network of
two-raised-to-power sixteen
off-the-shelf processors.
Those processors were identical,
coupled, and shared nothing.
Each processor operated
its operating system.

My scientific discovery
of the fastest computing
across the slowest processors
occurred at
fifteen minutes after 8 o'clock
in the morning
of the Fourth of July 1989.
That new knowledge is the reason
millions of processors

are now used to power
the fastest computers in the world.
The fastest computer
costs 40 percent more
than the mile-long Second Niger Bridge
at my ancestral hometown
of Onitsha, Nigeria.
The fastest computer is outlined
and defined
by millions of processors.
Before my scientific discovery,
the fastest computer
that's powered by one million processors
was merely a theory, or an idea
that was not positively true.

Inventing the World's Fastest Computer

My Origin Story in Fastest Computing

Each day in 1964 and at age nine
in Agbor (Nigeria),
I solved sixty mathematics problems
in sixty minutes.
I began programming the fastest
computers
at age nineteen
to solve the most difficult mathematics
problems.
And I computed on a supercomputer
at 1800 SW Campus Way,
Corvallis, Oregon, USA.
My breakout discovery
of the first world's fastest computing
across the world's slowest processors
occurred at age thirty-four (34),
in Los Alamos, New Mexico, USA.
At Los Alamos and in 1989,
I invented
how to compute at the fastest speeds.
And compute across a small Internet
that I visualized

as my small copy of the Internet.
And that I visualized as embedded
inside a sixteen-dimensional hyperspace.
After half a century of supercomputing,
I gained a more profound
and surer understanding
of why computing across
a million processors
makes the computer faster
and makes the supercomputer super.
My discovery was described
as the Philip Emeagwali formula
for world's fastest computing
across an Internet.
That invention was praised by
U.S. President Bill Clinton
in his White House speech
of August 26, 2000.
The Emeagwali divide-and-conquer
mathematical formula
is used to solve
the most difficult problems

arising in physics.
I was in the news because I discovered
how to solve
the most compute-intensive problems
and do so across
up to a billion coupled processors
that shared nothing.

6 Inventing the Nine Philip Emeagwali Equations

As an inventor who came of age
in the 1970s and 80s, I differed because
I didn't use the mathematical methods
that were used by mathematicians
in Corvallis, Oregon.
Or by mathematicians
in College Park, Maryland.
Or in the dozen places I conducted
my search for new mathematics

that's not in any textbook.
My search yielded nine
new partial differential equations
that could be used to more accurately
pinpoint oil deposits
that were buried millions of years ago
and about one mile deep
and across the 159 producing oil fields
in Nigeria.
And across the 65,000 oil fields
around the world.
My search in calculus
was for new partial differential equations
beyond the frontier of calculus.
And not yet published in any textbook.
I was searching for new knowledge
of how to solve
the arising partial difference equations
of computational linear algebra
from my
finite difference *discretization*
of the governing

partial *differential* equations.
Unlike other mathematicians,
I contributed to many sciences,
including the nine
Philip Emeagwali equations
that I contributed to mathematics.
And including the fastest computing across
up to one billion processors
that I contributed to physics, engineering,
and computer science.

Philip Emeagwali YouTube Channel

Because I contributed to many sciences,
I could post *a corpus* of scientific lectures
that represents my body of inventions.
I've distributed my lectures across
one thousand closed-captioned videos
that I shared on YouTube.
A hundred of my YouTube lectures

were on my world's fastest calculation
that made the news headlines, in 1989.
And did so because I solved
the most compute-intensive problems
across
a new global network
of sixty-four binary thousand
off-the-shelf, coupled processors
which I visualized
as my small copy of the Internet.

7 Breaking the Speed Barrier of Supercomputing

My invention—of the first supercomputing
across the world's slowest computers—
brought me fame.
It's the reason I am the subject
of school essays.
But my road to the pinnacle

of supercomputing
was strewn with thorns.
First, Gene Amdahl, a 1960s pioneer
of scalar supercomputing,
put forth his famous theory,
called Amdahl's Law of diminishing
supercomputer speed.
Amdahl's Law dismissed
the idea of fastest computing
across the slowest processors
as science fiction.
In plain language, Amdahl's Law,
stated that
not over eight processors
could power the world's fastest computer.
The second obstacle
to discovering the world's fastest
computing
was vector supercomputing.
Seymour Cray, then the most prominent
vector supercomputer pioneer,
agreed with Gene Amdahl

and believed in Amdahl's Law.
To everyone's surprise, I—then an unknown in the field of supercomputing—proved 25,000 vector supercomputer scientists who believed in Amdahl's Law wrong.
I proved them wrong by executing
the world's fastest calculation
and doing so across
my ensemble of the 65,536
slowest processors in the world.
Prior to my discovery that occurred
on July 4, 1989,
the world's fastest computers
were powered by up to only four
processors.
My invention was the first supercomputer to be powered by thousands of processors.

How I Achieved a Supercomputer Breakthrough

It made the news headlines
that I—an African supercomputer scientist
in the USA—had won
the highest award in supercomputing.
Computer scientists rank that award
as the Nobel Prize of Supercomputing.
I won that prestigious prize
because I discovered practical ways
of solving the most compute-intensive
mathematical problems
in science, engineering,
and medicine.
I made that ground-breaking
scientific discovery
at 8:15 in the morning, on July 4, 1989,
in Los Alamos, New Mexico, USA.
That was the scientific discovery
of fastest computing
that can take your computer

to the fastest level.
Harnessing millions of processors
is the essence
of what makes the supercomputer super.
My discovery made the news headlines
because the fastest computing
allows mathematicians
to solve their most difficult problems.
And solve them more accurately
and faster than before.
Briefly, my invention of fastest computing
across processors
yielded up to one-billion-fold increase
in the supercomputer's speed.
But did so without demanding
the expected
one billion-fold increase in cost.
And did so even though
the world's most powerful supercomputer
costs one billion, two hundred and fifty
million dollars.
The fastest supercomputer costs

40 percent more than the
mile-long Second Niger Bridge
at Onitsha, that is my ancestral hometown
in Nigeria.

Fighting Scientific Dogmas

In 1988, I was an unknown
supercomputer scientist.
I was the new kid
at the frontier of knowledge
of high-performance computing.
Furthermore, I drew attention because
I pointed out an egregious error
in the scientific knowledge of my elders.
Not only that, I discovered errors
and misunderstandings
in their classic textbooks
on computational physics,
partial differential equations of calculus,
and supercomputing across
up to a billion processors.

I was the young computer scientist
penalized for crying out aloud
that the Emperors
of the supercomputer world
had no clothes.
I fought against the supercomputing dogma
of Gene Amdahl.
His dogma is known as Amdahl's Law of
diminishing supercomputer speed.
That law erroneously decreed that
the fastest computing across
the slowest processors
will forever remain
an enormous waste of everybody's time.
I fought against the technological dogma
of Seymour Cray
of vector supercomputer fame.
Seymour Cray didn't believe that
one billion processors could be harnessed.
Likewise, I fought against the dogma
of Steve Jobs,
the pioneer of personal computing,

who didn't believe that
eight processors should power
the personal computer.

Today, the fastest desktop computer
is powered by up to 128 processors.
My discovery of the fastest computing
across the slowest processors
is the discovery
of the foundational knowledge
of all world's fastest computers.
And the discovery
of how up to a billion processors
can work together to make
the supercomputer super,
or fastest.

That discovery is the reason
my invention of how to execute
the fastest computing across
the slowest processors
is the subject of school essays on

inventors who contributed
to the development
of the fastest computers.

Thank you.

I'm Philip Emeagwali.

Further Listening and Rankings

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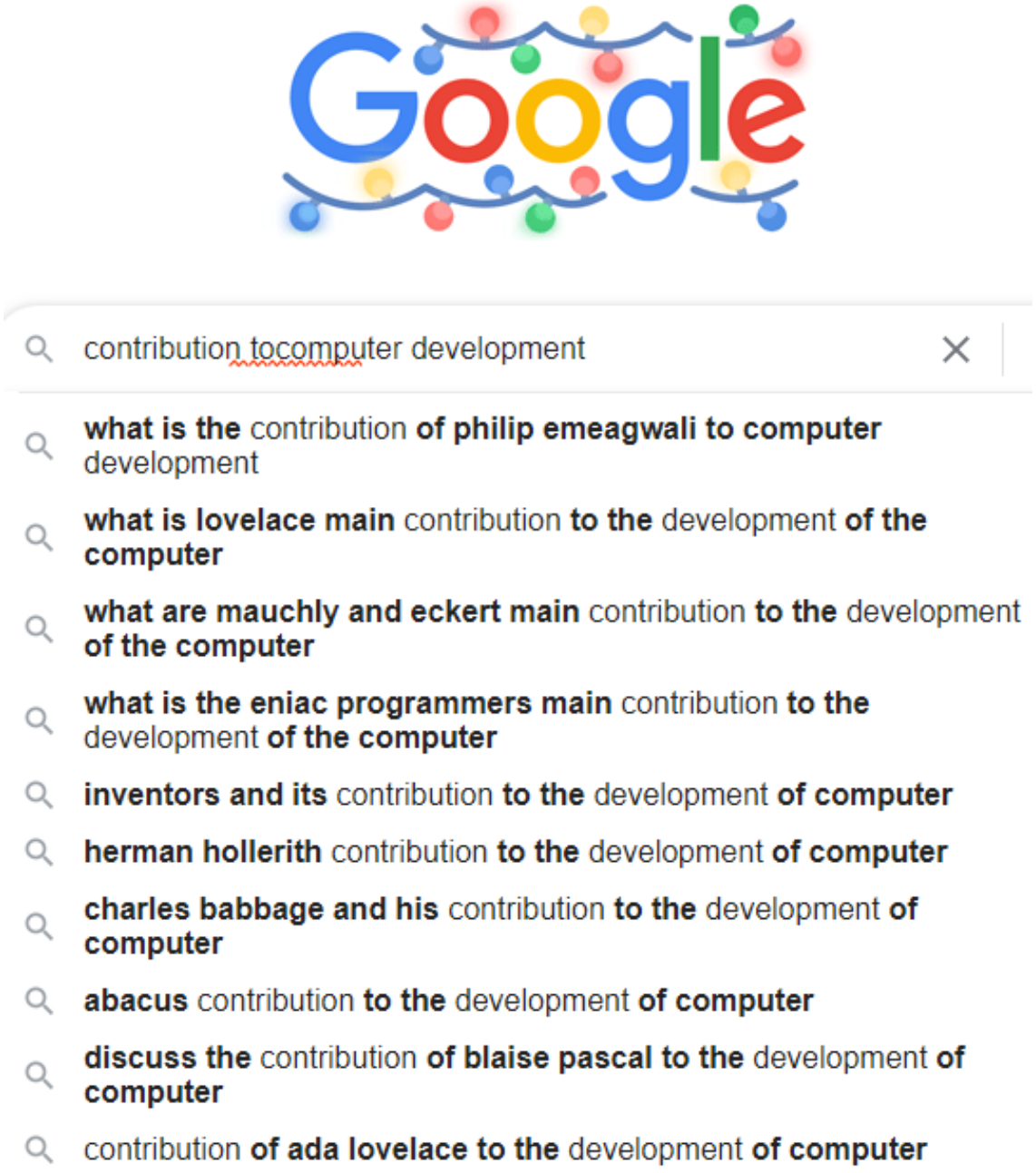

Google suggests the greatest computer scientists of all times. With the number one spot, Philip Emeagwali is the most suggested computer pioneer for school biography reports across the USA, Canada, UK, and Africa (December 8, 2021).

father of the internet

philip emeagwali father of the internet
tim berners lee father of the internet
vint cerf father of the internet
dr philip emeagwali father of the internet
leonard kleinrock father of the internet
nigerian father of the internet
bob kahn father of the internet
npr father of the internet
african father of the internet
father of the internet **al gore**

Google suggests the most noted fathers of the Internet. With four out of ten searches, Philip Emeagwali is the most suggested "father of the Internet" for schools across the USA, Canada, UK, and Africa (Labor Day 2019).