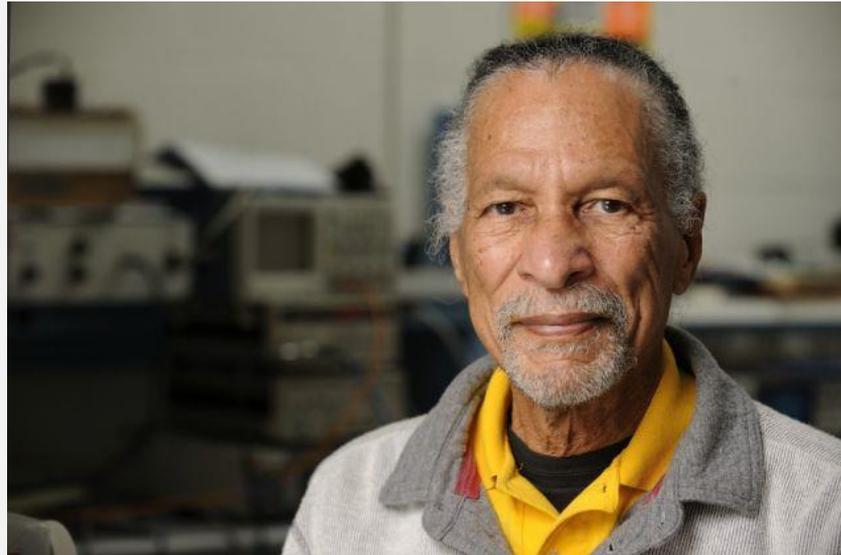


---

## James West

*Inventor, Entrepreneur, Physicist, Renowned Professor  
of Engineering at Johns Hopkins  
-His highest degree is his high school diploma!*

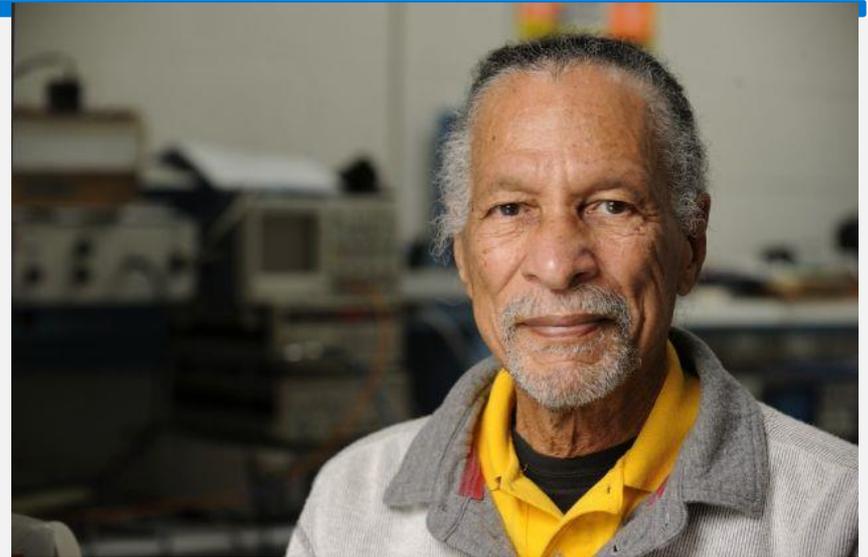


## Dr. Jack M. Wilson

Distinguished Professor of Higher Education, Emerging Technologies, and Innovation

# James West

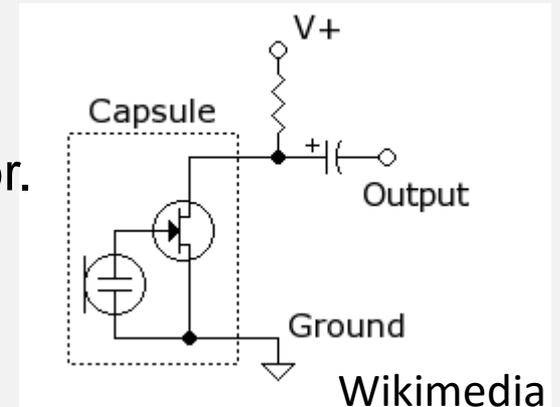
- James West attended Temple University to study Physics over his father's objections.
- He never graduated because he took an internship at Bell Labs where he essentially invented the electret microphone.
- He returned to Temple, but did not bother to graduate. He was accepted into the doctoral program and started working on his doctorate.
- Then Bell labs called and asked him to come back since his microphone stopped working and they could not understand why.



- He and Gerhard Sessler started working together and found out what was going on –leading to the invention of the microphone that nearly everyone uses today.
- West never finished his doctorate and never finished his BS. Today he is a professor of both Mechanical Engineering and Electrical and Computer Engineering at Johns Hopkins' Whiting School of Engineering.
- He holds more than 40 US and over 200 international patents. He has been inducted into the National Inventors Hall of Fame and the National Academy of Engineering. His many awards include the Acoustical Society of America's Gold Medal, the George Stiglitz Trophy from AT&T, the Benjamin Franklin Medal Award in Electrical Engineering, and the US National Medal of Technology and Innovation.
- West has received honorary doctorates from the University of Pennsylvania, Temple University, Michigan State University, and the New Jersey Institute of Technology –but has no earned degrees other than his high school diploma!
- <http://arstechnica.com/information-technology/2016/05/listen-up-james-west-forever-changed-the-way-we-hear-the-world/>

# The Electret Microphone

- The electret microphone is formed by a field effect transistor (FET) in a circuit with a permanently charged dielectric based capacitor.
- As acoustical waves strike the capacitor, it changes the capacitance which changes the gain of the FET amplifier circuit.
- The blocking capacitor on the output lets only the AC component of the signal pass –blocking the DC.
- Thus an acoustical wave is converted into an electrical wave.
- West and Sessler discovered that a permanent charge could be placed upon certain dielectrics based upon Teflon. That was the key to creating a microphone that would not quit over time.
- Today, the electret microphone is ubiquitous in phones and other sound equipment.



# Overcoming the discrimination of the time

---

- West's father objected to his study of physics since he believed that the only fields open to African Americans in that time were as a preacher, teacher, doctor, or lawyer.
- West was born in 1931, the grandson of a slave. The segregated schools in Farmville, Virginia denied him the science education he wanted, and after those schools were declared unconstitutional in *Brown vs the Board of Education*, Farmville closed ALL of the public schools. They remained closed for *ten years*.
- None of this stopped him. On the contrary, it motivated him to devote his life to science and education and particularly to creating opportunities for others.
- He created the *Association of Black Laboratory Employees (ABLE)*, - dedicated to opening up career opportunities for black scientists and professionals.
- He founded the *Corporate Research Fellowship Program*, which provides support for graduate students seeking advanced degrees in the sciences, and
- the *Summer Research Program*, which brings underrepresented minority and women students into Bell Labs and AT&T as interns.

# A prodigious scientific output.

---

- He holds more than 40 US and over 200 international patents.
- 
- He has been inducted into the National Inventors Hall of Fame and
- 
- The National Academy of Engineering.
  
- His many awards include
  - The Acoustical Society of America's Gold Medal,
  - The George Stiglitz Trophy from AT&T,
  - The Benjamin Franklin Medal Award in Electrical Engineering, and
  - The US National Medal of Technology and Innovation.
  
- But he never really had any time to finish his degrees!

# Legacy

---

- At age 70 he launched his second career as a Professor of Mechanical Engineering and Electrical and Computer Engineering at Johns Hopkins' Whiting School of Engineering.
- What does he want his legacy to be:
- *“Some of the most ambitious parents that I've ever met have been parents... who have nothing but who want better things for their children, genuinely want that, more than any affluent person that I know. They don't want their children to have to go through the same stuff that they did... I want the parents' wish to come true. I want their children to have a better opportunity at life than they do. And I happen to think that one of the best places to do that is not philosophy, but science. Because this is where the real jobs are, where the real jobs will be in the future. And where, if life is going to be improved, it's going to be improved through STEM. There's no other way.”*