Albert Vinicio Baez

(1912-2007)

MEXICAN-AMERICAN FIRST X-RAY MICROSCOPE

Microscopes have been used since the 13th century, but the early pioneers of microscopy could not have imagined the device invented by Albert Baez.

Baez was born in Puebla, Mexico in 1912, and grew up in Brooklyn, New York, where his father was a minister in a predominantly Puerto Rican church. The Baez family had little money but big hearts. As a youth, Albert considered a career as a clergyman before his interests turned to math and physics.

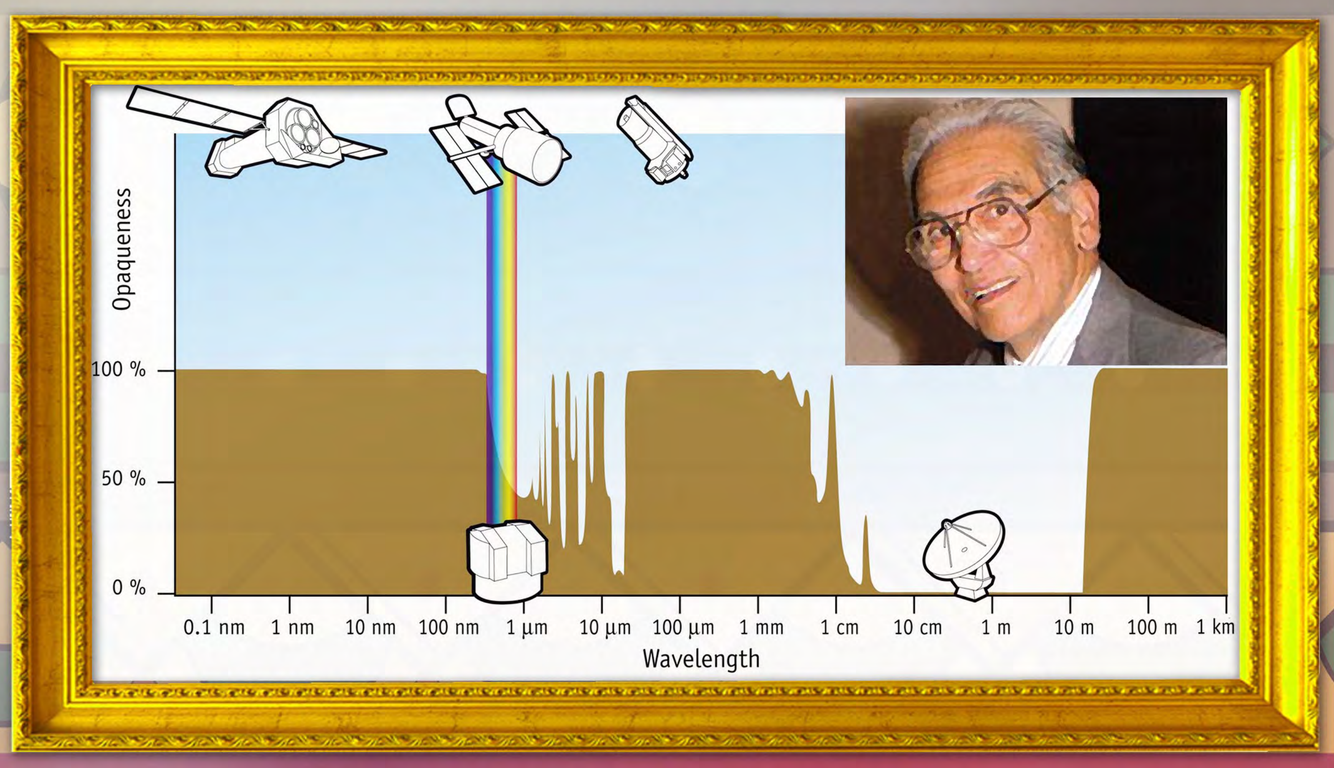
Baez earned a Bachelor's degree in Mathematics from Drew University in New Jersey, a Master's degree in Physics from Syracuse and a Ph.D. in Physics from Stanford. He and his wife became Quakers and had three daughters. One daughter - Mimi Fariña - became a counterculture icon and another daughter - Joan Baez - was a popular folk singer and social critic. In fact, Joan was a trailblazer in her own right, becoming only the second Latina (after Eva Perón) to grace the cover of *Time* magazine.

In 1948, Baez met Stanford Professor Paul Kirkpatrick; together they developed the first X-ray microscope to observe living cells. They used a technique called "grazing incidence reflective optics" which essentially bounced X-rays off parabolic curved mirrors. This invention became a vital part of modern medicine now and is still in use today.

During the Cold War, when many of his colleagues were taking lucrative positions in the defense industry, Baez - a lifelong pacifist - chose to stay in academia. In 1951, he spent a year teaching at Baghdad University through the United Nations Educational, Scientific and Cultural Organization (UNESCO). He continued his UNESCO work in the 1960s in Paris.

While his X-ray microscope enabled humanity to see deep into the smallest living organisms, Baez was determined to use his technique to view objects in deep space. Working with the Smithsonian Astrophysical Observatory, Baez developed an X-ray telescope in 1961. In order to get above the Earth's opaque atmosphere, X-ray telescopes must be mounted on high altitude rockets or satellites. An X-ray telescope based on Baez's design was aboard Space Shuttle Columbia during a 1990 mission.

The Hispanic Engineer Achievement Awards Corporation (HENAAC) created the Albert V. Baez Award for "Technical Excellence and Service to Humanity", and Baez was inducted into the HENAAC Hall of Fame. He served as president of Vivamos Mejor/USA, a charity that helps impoverished villages in Mexico and Guatemala. He died in California in 2007.



Graphic rendering of Albert Baez portrait adapted from: AP / The Marin Independent Journal, Bob Hax image, 1984

X-ray microscope and Satellite X-ray telescope images courtesy of Wikipedia

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