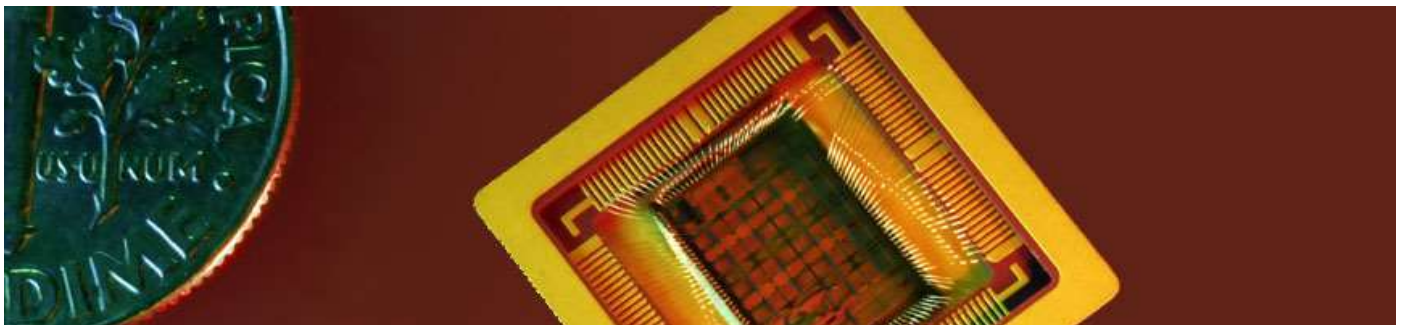


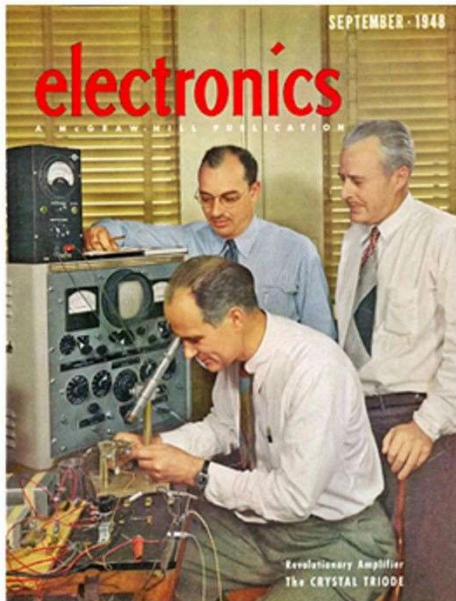
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Explore
Overview
Stories
Timelines
Collections
Playlists
Blogs
Publications
Connect
Overview
Events
K-12 Students & Educators
Families & Community Groups
Colleges & Universities
Business & Government Leaders
Volunteers
Visit
Overview
Make a Plan
Exhibits at the Museum
Tours & Group Reservations
Customize It
Venue
About
Overview
This is CHM
Centers
Programs
News
Leadership
Join & Give
Overview
Ways to Give
Donor Recognition
Institutional Partnerships
Upcoming Events
Hours & Directions
Stories
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Privacy
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1947: Invention of the Point-Contact Transistor

John Bardeen & Walter Brattain achieve transistor action in a germanium point-contact device in December 1947.



🔍 Bardeen, Brattain, and Shockley (seated) on the cover of Electronics magazine September 1948 'Crystal Triode' issue

Credit: Nielsen



Encouraged by Executive Vice President Mervin Kelly, William Shockley returned from wartime assignments in early 1945 to begin organizing a solid-state physics group at Bell Labs. Among other things, this group pursued research on semiconductor replacements for unreliable vacuum tubes and electromechanical switches then used in the Bell Telephone System. That April he conceived a "field-effect" amplifier and switch based on the germanium and silicon technology developed during the war, but it failed to work as intended. A year later theoretical physicist John Bardeen suggested that electrons on the semiconductor surface might be blocking penetration of electric fields into the material, negating any effects. With experimental physicist Walter Brattain, Bardeen began researching the behavior of these "surface states."

On December 16, 1947, their research culminated in the first successful semiconductor amplifier. Bardeen and Brattain applied two closely-spaced gold contacts held in place by a plastic wedge to the surface of a small slab of high-purity germanium. The voltage on one contact modulated the current flowing through the other, amplifying the input signal up to 100 times. On December 23 they demonstrated their device to lab officials - in what Shockley deemed "a magnificent Christmas present."

Named the "transistor" by electrical engineer John Pierce, Bell Labs publicly announced the revolutionary solid-state device at a press conference in New York on June 30, 1948. A spokesman claimed that "it may have far-reaching significance in electronics and electrical communication." Despite its delicate mechanical construction, many thousands of units were produced in a metal cartridge package as the Bell Labs "Type A" transistor.

« Previous Milestone

Next Milestone »

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