



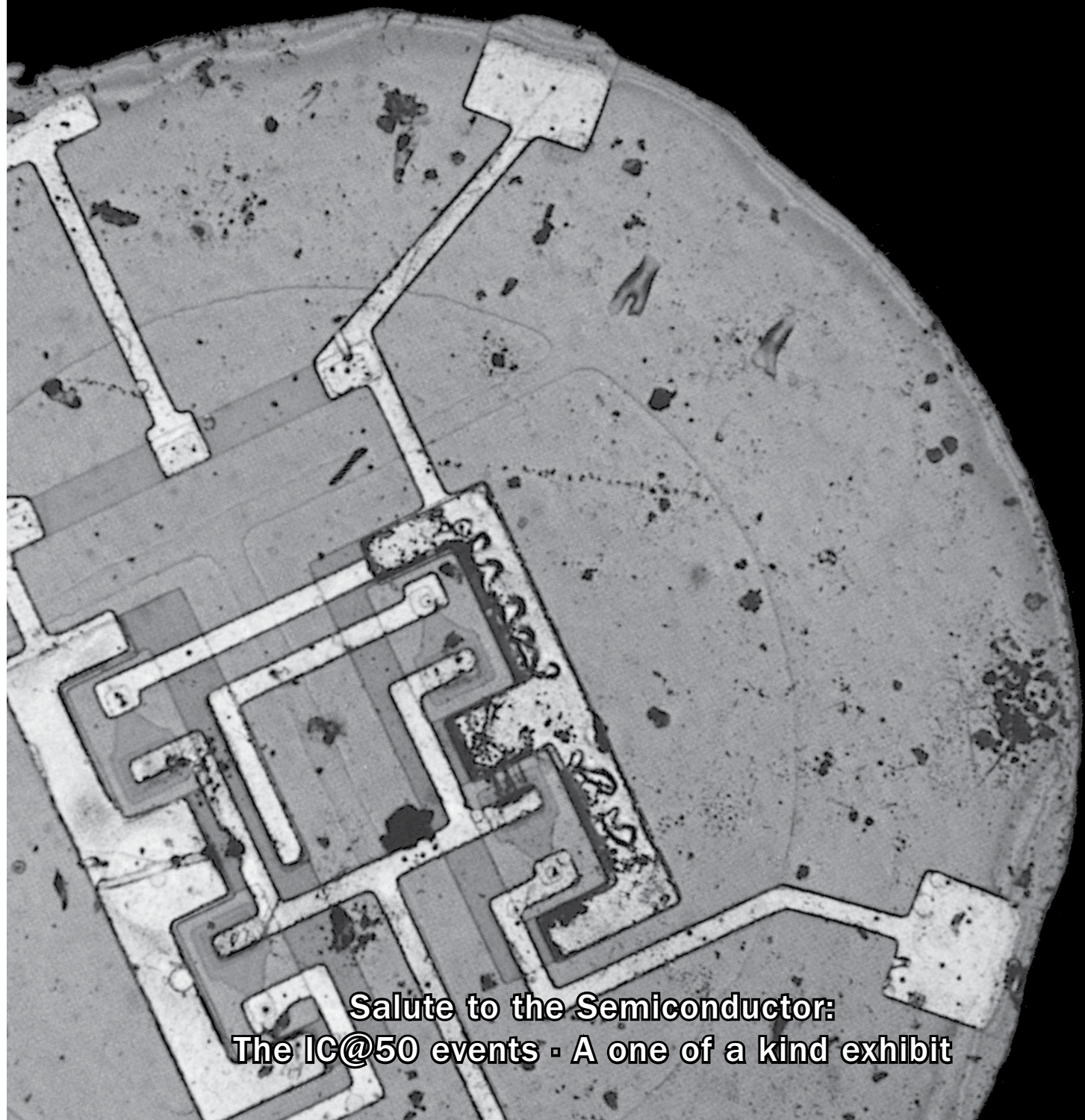
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The CHM

Muse

STAFF & VOLUNTEER NEWSLETTER

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Salute to the Semiconductor:
The IC@50 events · A one of a kind exhibit

Salute to the Semiconductor

The IC@50 Events

By Karae Lisle, Chief Marketing Officer

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As part of our 2009 Salute to the Semiconductor program, in May we celebrated the 50th anniversary of the integrated circuit (IC@50). Co produced by the Chemical Heritage Foundation, IEEE Santa Clara Valley Section, CHM hosted a week of celebratory events with over 1000 attendees.

The festivities included VIP receptions of old friends toasting a half century of fond memories and achievements.

CNET reported: "...As the week wore on at the Computer History Museum, it became clear that with a birthday of this magnitude, it was hard to overstate the impact of the integrated circuit not just on the technology industry, but on modern society."



The Fairchild 8 are projected on the screen in Hahn Auditorium behind panelists at the Friday May 8 lecture.

The IC@50 Evening Events

On Wednesday, May 6th, over 350 of the semiconductor industry's most passionate attended the evening program, titled: "From "Tinkertoys" to "Solid Circuits": Microcircuitry in the Late 1950s", with speakers:

- **Michael Riordan:** Adjunct Professor of Physics at the University of California, Santa Cruz, and Lecturer in Stanford University's History and Philosophy of Science Program. He is the coauthor (with Lillian Hoddeson) of "Crystal Fire: The Birth of the Information Age" (W.W. Norton, 1997), which was awarded the 1999 Sally Hacker Prize of the Society for the History of Technology.
- **Charles Phipps:** Joined Texas Instruments in 1957, where he spent the next 30 years of his career. His roles at TI included working with Jack Kilby to develop market opportunities for integrated circuit technology and managing the department that evolved into the MOS business unit.
- **Jay W. Lathrop:** In 1952 he joined the National Bureau of Standards (aka Army's Diamond Ordnance Fuze Laboratory). He worked on the microminiaturization of solid-state circuits for the Dept. of Defense. In 1958 he joined Texas Instruments, where he worked on integrated circuits with Jack Kilby.
- **L. Arthur D'Asaro:** Joined Bell Telephone Laboratories in 1955 and continued there for the next 41 years. He worked on a variety of semiconductor devices, and co-developed an integrated silicon multi-transistor counting device called a stepping transistor, using photolithography and diffusion.

It was in 1959 that the men of Fairchild Semiconductor first created the planar integrated circuit. On Friday, May 8th two of the most famous surviving men of that team, Gordon Moore and Jay Last, were feted by 400 friends, former colleagues, and fans for their roles in creating the modern structure of the integrated circuit that today powers everything from the iPhone to Google's giant server farms. The evening program was titled, "The Planar Integrated Circuit: Building the Future at Fairchild Semiconductor," with speakers:

- **Gordon Moore:** Joined Shockley Semiconductor in 1956 and with Robert Noyce and others he founded Fairchild Semiconductor Corporation in 1957. As head of R&D at Fairchild, he is best known for "Moore's Law," in which he predicted that *the number of transistors the industry would be able to place on a computer chip would double every year*. In 1968 he co-founded Intel Corp. with Robert Noyce where he served as EVP until 1975 when he became President and CEO. In 1979, Moore became Chairman of the Board and CEO, holding that position until 1987.
- **Jay Last:** Joined the Shockley Semiconductor Laboratory in 1956. As part of the Traitorous Eight, he departed to found Fairchild Semiconductor — the first company to manufacture silicon mesa transistors and planar integrated circuits.
- **Christophe Lécuyer:** A Principal Economic Analyst in the Office of the President of the University of California. He is the author of "Making Silicon Valley: Innovation and the Growth of High Tech, 1930-1970"
- **Leslie Berlin:** The Project Historian for the Silicon Valley Archives at Stanford University and the author of "The Man Behind the Microchip: The Invention of Silicon Valley," a biography of Robert Noyce.

"It's hard to believe that 50 years have passed. The reality of today is beyond our wildest imaginations of those days."
--Jay Last

IC @ 50 continued...CNET reported: "On Friday evening, John Hollar, CEO of the Computer History Museum, put the impact of the IC this way: 'It became the electronics technology through which we have created our contemporary digital world. It is indispensable to modern life.'



Moore and Last, both 80, were part of a group of eight men who famously left Shockley Semiconductor to strike out on their own and form Fairchild Semiconductor, which became 'the Google of its day,' according to Leslie Berlin. The contributions of Jean Hoerni and Robert Noyce, both deceased, were also recounted by the speakers. But Moore and Last, who both gave thoughtful, lighthearted speeches, were humble about the recognition being bestowed upon them for their work that began in the late 1950s.



Jeanette Wood employs the 'voice of god' system to announce the lecture

Back then, they were racing against time and Texas Instruments, which was also working on building its own integrated circuit and would eventually win the patent on it after a long, drawn-out legal battle once the planar integrated circuit was built. It wasn't immediately obvious back in those days what the impact would be.

Moore went on to treat the audience--many of them his former colleagues at Fairchild and Intel, which he co-founded--to a brief history of how the IC came to be. He recounted the days when the eight of them, including Noyce and Hoerni, staged a mutiny at Shockley and struck out on their own, determined to find an existing company that wanted to use them to build out a semiconductor business.



Gordon Moore

Moore said the men, most of whom were in their late 20s at the time, weren't sure how to go about it, so they opened The Wall Street Journal and circled the names of 30 companies they thought might be interested in their services. None bit. But when they met Sherman Fairchild, who owned Fairchild Camera and Instrument Corporation, their luck changed. In just three years, the men of Fairchild Semiconductor had figured out the structure that would shape the commercial and consumer electronics revolution about to unfold over the next half century. Their achievement of building the planar IC can be simplified this way, as Last put it: 'We put all the devices on the same piece of silicon, connected them altogether, and isolated them one from another.'

But they made other indispensable choices. For example, they decided to keep a layer of silicon oxide on top of the wafer, thanks to Hoerni's insistence, at a time when that went against most accepted knowledge in the industry. Silicon's potential seemed limited at the time, except in special applications, Last remembered. The Fairchild men also paved the way for the mass production of chips by building increasing large arrays.

Moore's Law: The number of transistors the industry would be able to place on a computer chip would double every year.
-- Gordon Moore

Moore also had another lasting impact on technology, thanks to an article he wrote in 1965. In it, he laid out his assertion that the number of transistors per square inch on integrated circuits would double every year for the foreseeable future. We know it today as Moore's Law, and it is applied broadly to the increasing capability of most electronic devices. While Moore joked that it's 'obviously as important as Newton's Law,' he did acknowledge that at some point, it will no longer hold true. 'You get to the point where you can't shrink things anymore. But that won't stop innovation.'

As to what's next for the industry, Moore and Last agreed that "silicon reigns supreme" for now. Moore said that whatever technology does come next to replace the silicon chip, it would have to 'spring full blown'. As he sees it, 'Silicon technology now is (the result of) a few billion dollars of R&D. To compete with that would require a monstrous investment.' For his part, Last said he sees the 21st century as the century of biology, where 'electronics with new human biological processes will expand.'

Both men said that half a century ago they never expected to be where they are now, but that they wouldn't change a thing. Though he was speaking for himself, Last could have been voicing the feelings of the entire electronics industry, with his closing statement: 'It's been a great ride for me these last 50 years.'



Marketing's Fiona Tang gets a preview of the display cases

One of a Kind Event Exhibit



David Laws puts together this outstanding exhibit



The Kilby documents

On both evenings, IC@50 attendees were granted the special opportunity to see an exhibit of rare integrated circuit artifacts and the first public presentation of the original patent notebooks of Jean Hoerni, Jay Last, Gordon Moore, and Robert Noyce of Fairchild Semiconductor. These notebooks were displayed alongside a replica of the notebook of Jack Kilby of TI. The Kilby and Noyce documents sparked one of the most tenaciously fought intellectual-property battles yet seen by the U.S. Supreme Court. National Semiconductor, the successor to Fairchild Camera and Instrument Corp., and a sponsor of the program, generously loaned the original Fairchild notebooks for display at the IC@50 events. As the original Kilby notebook is currently undergoing restoration, TI created a replica copy especially for the event that will be donated to the Museum's collection.

Plaque Unveiling Ceremony

In the afternoon of Friday, May 8, over 100 people attended the IEEE Commemorative Plaque Unveiling at the original Fairchild site in Palo Alto. Mountain View Mayor, Margaret Abe-Koga unveiled the plaque and Brian Halla, Chairman and CEO of National Semiconductor, gave the keynote address. Additional speakers included:

- Lewis Terman, 2008 IEEE President
- Gordon Moore
- Michael Riordan

Who's Who!

- Dignitaries and loyal CHM supporters attending both IC@50 events included:
- Several CHM Trustees, including Donna Dubinsky, Len Shustek, Dave House
 - CHM Fellow, Don Knuth
 - City of Mountain View Mayor Margaret Abe-Koga, participated in the unveiling of the IEEE Commemorative plaque at the original Fairchild office site
 - Gene Franz, Senior Fellow at Texas Instruments
 - Victoria Downing, Chair and Chief Executive of the Kilby Foundation
 - Several Kilby Laureates
 - Brian Halla, Chairman and CEO of National Semiconductor
 - Dick Schubert, who made an enormous contribution by loaning the landmark notebooks of Robert Noyce
 - Lewis Terman, past president of the IEEE
 - The alumni of Fairchild Micrologic
 - Stan Myers, President and CEO of SEMI
 - George Scalise, President of the Semiconductor Industry Association (SIA)
 - Arnold Thackery, Chancellor of the Chemical Heritage Foundation (CHF) and Tom Tritton, President of CHF
 - Members of the CHM Semiconductor SIG

This week-long celebration required a year-long planning effort by the IC@50 Organizing Team:

- Dick Ahrons, IEEE Santa Clara Valley Section
- David Brock, Chemical Heritage Foundation
- David Laws, CHM Semiconductor SIG
- Karae Lisle, Computer History Museum
- Rosemary Remacle, CHM Semiconductor SIG

A job well-done!

Notes from the Volunteer Steering Committee

By Peter Samson

Monthly Meeting, April 22, 2009:

These new topics were brought up:

Jim Somers reviewed the challenges to the volunteer program posed by the transition period leading up to the full opening of the new main exhibit. (See last month's minutes for a summary.) At this meeting he discussed specifically the issue of recruitment.

Upon opening the big new exhibit, the Museum foresees the need for considerable growth of the volunteer programs, especially in the front of house. Annual visitor counts are expected to increase from the current 20,000 ~ 24,000 to perhaps 120,000 ~ 150,000 in the future. We will need four or five greeters per shift, more demonstrators, etc.

We need to develop a more scalable and sustainable process for recruitment of volunteers. Current practice to recruit volunteers involves these stages: making contact, registration, orientation (information session), and placement. Members of the VSC told of their recruitment, and it became clear that in the past it has been handled to some extent informally. Under consideration is a more formal process application (by a Web form); a written volunteer agreement; scheduled volunteer open houses; and interviews between volunteers and staff.

Gary Matsushita said that with the opening of "2000 Years," there will be staff present during all public hours, both to provide front of house supervision and to maintain the exhibits, workstations, and videos.

The following displays will be available for visitors during the transition period: Innovation in the Valley, Mastering the Game: the Silicon Engine; and the IBM 1401. The PDP-1 demonstrations are in doubt during that period due to issues of access to the Restoration Demo room; objections have been raised to escorting visitors through either the current Visible Storage space, or the exterior door near the Demo Room. (more study to follow).

Jim Somers will discuss the other challenges to the volunteer program- training and retention- at the next meeting, after which we will be better informed to take up the issues of VSC purpose and structure.

Want to know more? The full minutes are posted in a binder in the Zuse Lounge.



Volunteer Corky Lakin manned the video camera at the lectures

Numbers for April

Total Visitors during Open Hours: 1666
(April 2008 = 1167)

Tour Attendance: 620

Babbage Attendance: 844

PDP-1 Attendance: 89

1401/Data Processing Attendance: 24

Exhibit Visitors Associated with Events: 20

Front Door Donations: \$1618.63

Store Sales: \$4,777.47

March Volunteer Numbers

Total number of Volunteers: 109

Total number of Volunteer Hours: 1417.1

Value of Hours: \$32,295.70

The Calendar

- | | |
|---------|---|
| June 6 | Volunteer Orientation
10 to 11 a.m. |
| June 11 | CHM Soundbytes
An Evening with NetApp founder
Dave Hitz |
| June 20 | Volunteer Saturday @ Shoreline
9 a.m. to 3 p.m. |
| June 25 | Salute to the Semiconductor
CHM Soundbytes
Justin Rattner, Intel CTO
12 noon- (bring your lunch) |

Great Acknowledgements From IC Program Participants

A Letter from Jay Lathrop to John Hollar...

6 What a great program IC @ 50 was! I thoroughly enjoyed myself during the entire three days I was present. I met old friends and made new ones. The Computer History Museum was the ideal place for remembering the transformational events that occurred a half century ago. I was very impressed by the efficiency of your operation, the expertise of the video technicians, and the flawless execution and archiving of the program. David Laws did an outstanding job as program chair of my session. Rosemary Remacle ably shepherded me around the museum and the Mountain View environment. Carina Sweet made ideal airline and motel reservations ...

Perhaps the most fascinating part of the program for me was the great interest and enthusiasm shown by the large (400+) audience at each session. When the program was over they wanted to stay around and continue discussions until the museum closed! It is a tribute to you and your staff that the CHM is able to attract such an audience. Of course, it doesn't hurt that the location of the museum is in the heart of Silicon Valley, the nation's leading high tech center!

I am sure that Jack Kilby and Bob Noyce would have been extremely pleased by the meeting which celebrated both the technological tipping point and the inventors who made it happen. I am thankful to have been able to participate.

Sincerely, Jay

And from Mountain View Mayor Margaret Abe-Koga ...

Thank you, John, for inviting me to be a part of the plaque unveiling. It was quite an honor to be amongst such a distinguished group. Congratulations on a successful event and what looked to be a successful week. The Computer History Museum brings great distinction to our City of Mountain View, we are proud to have you here. My heartfelt appreciation to you and your entire staff for making the Museum the wonderful place that it is. As always, if there is anything I can do to be of assistance, please let me know.

Gratefully, Margaret

Jennifer Alexander, our Graphic Designer, noticed this neat CHM – like logo pattern formed by shadows. Do you know where it is? Hint- it happens for only 45 minutes each day.



The Editors Desk

Editors: Jim Somers, Marcin Wichary, Gary Matsushita
This month's contributors: Karae Lisle, David Laws, Peter Samson, Jim Somers, and Marcin Wichary



New Staff Hires

Mary Owen has joined the Development team as Manager of Development.

Cheryl VanGundy is an intern for Software Archives

Amanda Grundmann is our new Documents Archive intern

This Month in History

May 17, 1943: US Army and University of Pennsylvania Sign Contract to Develop ENIAC

ENIAC (Electronic Numerical Integrator and Computer), an early an-electronic computing system, was developed and built by the US Army for its Ballistics Research Laboratory. It was the first system to use vacuum tubes rather than electromagnetic switches. Its purpose was to calculate ballistic firing tables. ENIAC was designed by J. Presper Eckert and John William Mauchly of the University of Pennsylvania. Constructed at the Moore School of Electrical Engineering, when first commissioned, the computer was known as Project PX. It cost almost \$500,000 at the time. Unveiled on February 14, 1946, it operated until November 9, 1946. It was then refurbished, given a memory upgrade, and transferred to the Aberdeen Proving Grounds, Maryland, in 1947. On July 29th, it was turned on again and ran continuously until 1955.

Trivia

Who was the first-dot-com exec to be named Time's Person of the Year?

April's Question and Answer

How did the Winchester drive get its name?

The term Winchester comes from an early type of disk drive developed by IBM that had 30 MB of fixed storage and 30 MB of removable storage; so its inventors called it a Winchester in honor of its 30/30 rifle.

