

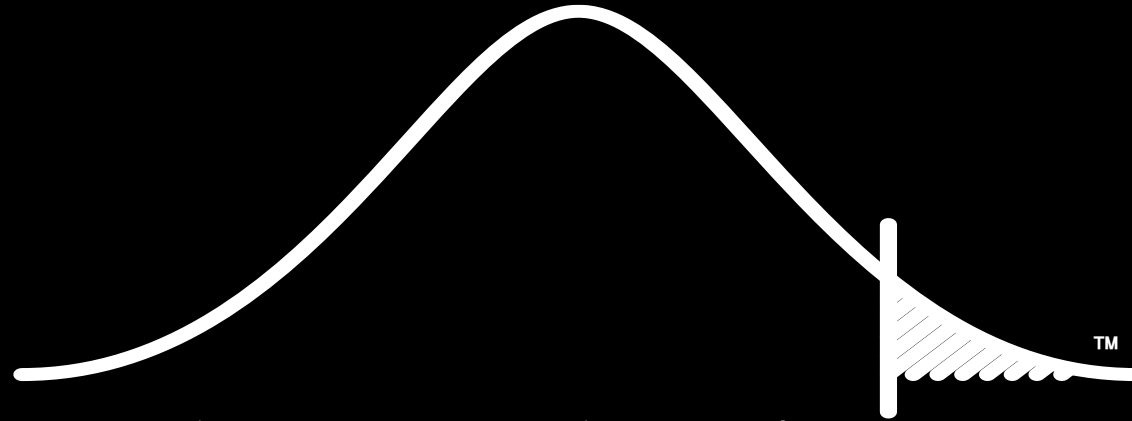


Flash Memory Summit

#FMS2022
@flashmem

Welcome to FMS 2022!

Chuck Sobey
General Chairman
Chief Scientist of ChannelScience
August 2-4, 2022, Santa Clara Convention Center



ChannelScience

Establish the State-of-the-Art™

Technology Strategies and Evaluation of
Emerging NVM Technologies

Happy Anniversary!



Flash Memory Summit



Annual Flash Chip Revenue > \$1,600,000



YEARS OF
NAND FLASH MEMORY
INNOVATION

Thank You Celebration Sponsors

KIOXIA
Samsung
SK hynix
Western Digital



16th Annual Flash Memory Summit



Flash Memory Summit



\$ 15,610,575,000 \$ 18,568,940,000 \$ 20,076,313,000 \$ 22,182,405,000

NAND prices drop below DRAM prices.

U3 software system for USB flash drives introduced by SanDisk and M-Systems.

SanDisk and Motorola introduce TransFlash card, now the microSD card.

Datalight introduces multi-threaded "FlashFX Pro." management software to support multimedia NAND devices.

Spansion announces MirrorBit Quad 4-bit NOR.

90nm process announced.

Hynix and ST Micro form flash joint venture.

Hynix NAND product introduced.

Infineon NAND product introduced based on Saifun Charge Trap Flash.

NAND revenues exceed \$10B.

Over three billion flash chips ship.

NAND GB shipments overtake those of DRAM.

Apple introduces first two flash-based iPods: iPod shuffle and iPod nano.

Microsoft introduces Hybrid Hard Disk Drive concept.

MMCmicro card introduced by MMCA.

70nm process announced.

Micron introduces NAND product.

Flash revenues exceed \$20B.

First Flash Memory Summit held in San Jose.

Intel introduces Robson Cache Memory (now called Turbo Memory).

Microsoft introduces ReadyBoost.

SanDisk announces 3-bit MLC (aka TLC) NAND technology.

M-Systems announces 4-bit MLC technology.

SanDisk announces microSDHC card.

SanDisk acquires Matrix Semiconductor.

SanDisk acquires M-Systems.

Samsung and Seagate demonstrate first Hybrid Hard Disk Drives.

IMFT formed by Intel and Micron to manufacture NAND flash.

Flash revenues exceed \$22B, almost 9 times 1997 revenues.

NAND revenues exceed \$14.5B.

Non-Volatile Memory Host Controller Interface (NVMHCI) Working Group formed, with Intel's Amber Huffman as Chair.

Toshiba introduces eMMC NAND.

IMFT begins shipping 50nm NAND flash.

Toshiba introduces first SATA-based MLC SSD.

Apple introduces iPhone.

SanDisk acquires Fusion-io announces 640GB ioDrive MLC NAND-based PCIe X4 board.

BitMICRO launches 3.5" SSD with capacity of 1.6TB (for military applications).

Spansion acquires

SanDisk announces 3-bit MLC (aka TLC) NAND technology.

M-Systems announces 4-bit MLC technology.

Samsung and Seagate demonstrate first Hybrid Hard Disk Drives.

IMFT formed by Intel and Micron to manufacture NAND flash.

First Flash Memory Summit held in San Jose.

56nm process announced.

300mm wafers begin production.

Open NAND Flash Interface (ONFi) V1.0 spec published.

Numonyx and Samsung introduce phase change NVM.

Not 17th Annual FMS?



Flash Memory Summit



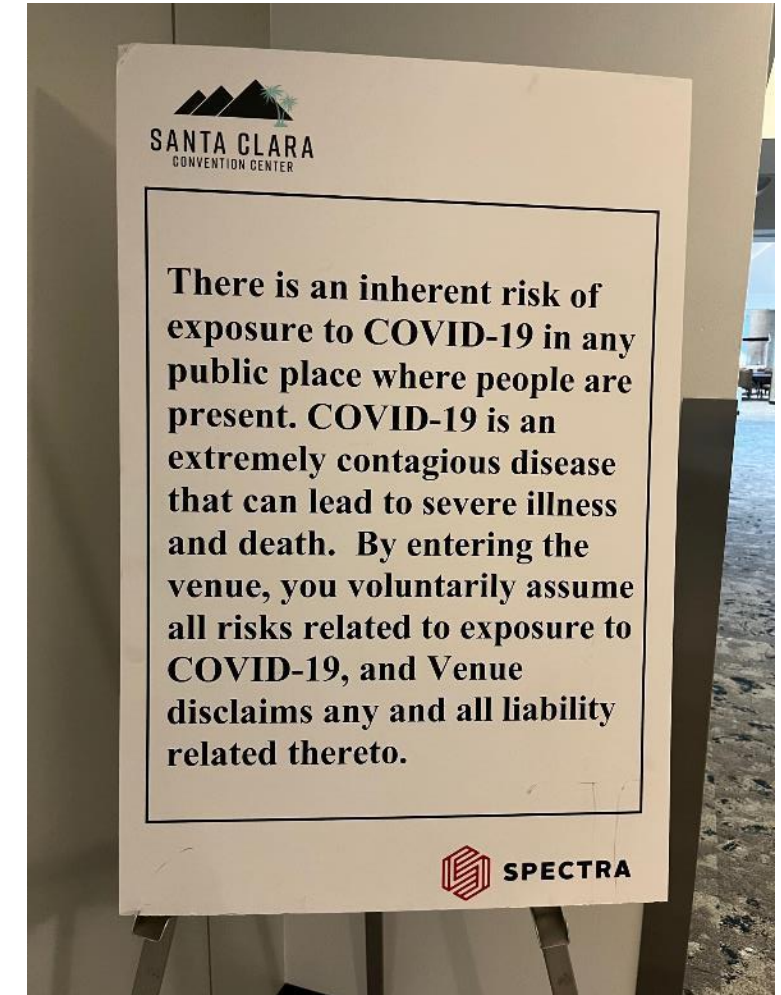
- 2019
 - Last time we met in-person (August 6-8)
- 2020 – vFMS
 - Postponed to November 10-12
- 2021 – NO FMS
- August 2-4, 2022
 - Back in-person!

COVID Precautions



Flash Memory Summit

- We are following the recommendations of Santa Clara county and venue
- Masks are not required, but recommended (and available)
- Use hand sanitizer, located throughout the venue
- Personal responsibility to self-monitor
- If you believe you may be infected, please isolate and seek treatment



Expect to See



Flash Memory Summit

- Old friends, new friends, decision makers, top technologists
- Respected analysts, press, bloggers, and podcasters
- Latest hardware, software, and services
- New announcements

Missing a Friend: Alan Land Passed in 2022



- FMS Sales Director from 2006 – 2020
- Gifted Musician



In-person, Not Virtual



Flash Memory Summit

FMS will not be streamed

Keynotes are recorded

Person-to-person networking makes lasting connections

Q&A and follow-up

Touch the products

Serendipity

- Please post about the event, exhibits, awards, and sessions
- Twitter/LinkedIn
 - @flashmem
 - #FMS2022
- Mobile-friendly website (no mobile app this year)
 - Wi-Fi sponsor: **neo semiconductor**
 - Network: **Flash Memory Summit**
 - Password: **FMS2022!**

Today 4:00 – 7:00PM – 35th Anniversary of NAND Flash Celebration
Tonight 7:30 – 9:30PM – Beer, Pizza, and Chat with the Experts

Wednesday Exhibits open Noon-7:00PM
Thursday Exhibits open 10:00AM – 2:30PM

Thank You Sponsors and Exhibitors!



Flash Memory Summit

Flash Memory Summit 2022
Santa Clara Convention Center
Halls A-D
Santa Clara, CA

Exhibit Hall
SOLD OUT!
We wouldn't be
back without you!

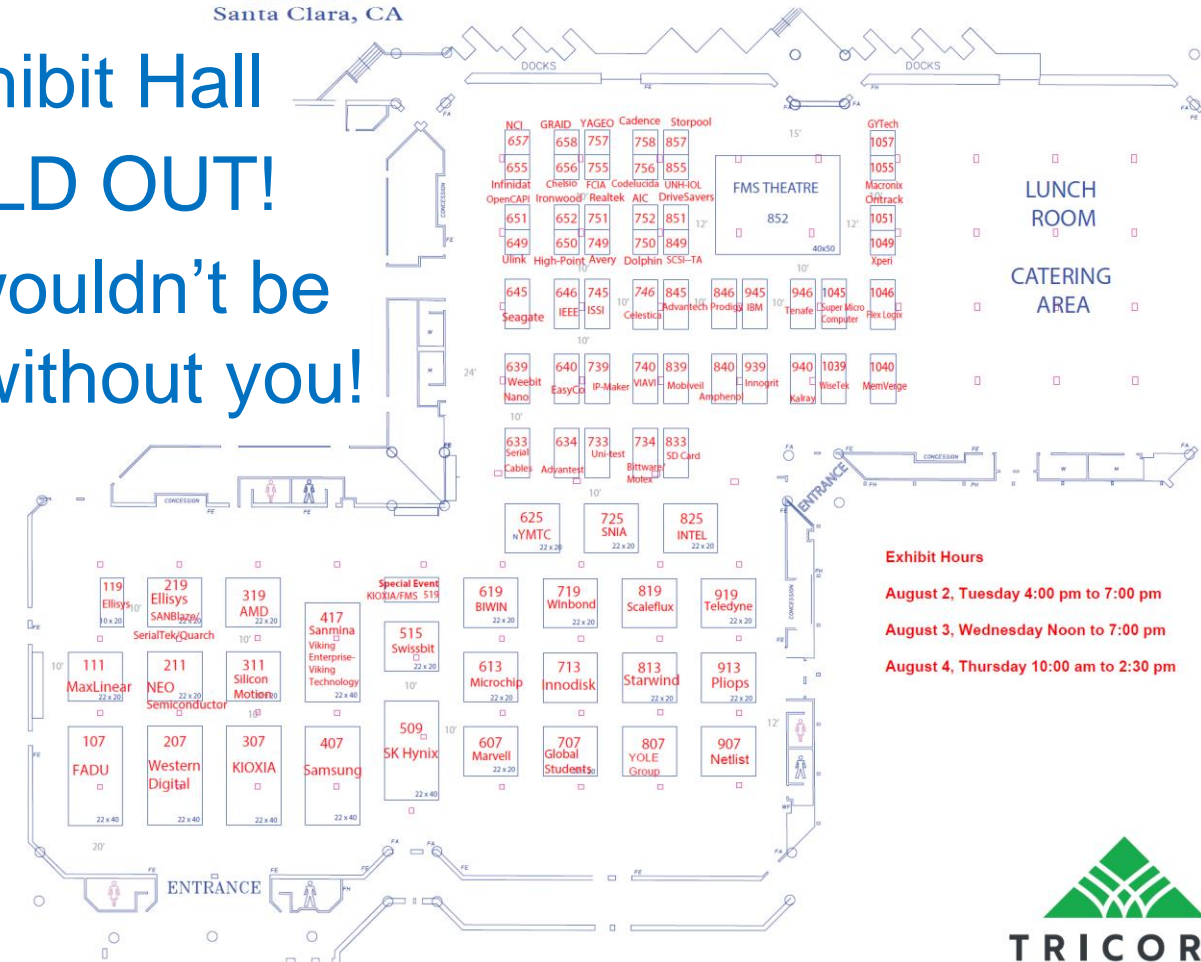


Exhibit Hours

August 2, Tuesday 4:00 pm to 7:00 pm

August 3, Wednesday Noon to 7:00 pm

August 4, Thursday 10:00 am to 2:30 pm



Don't Miss Anything Else!

Monday, Pre-conference Seminars

- Neutralizing Ransomware Extortion
- SmartNIC/DPU Storage Solutions
- New Challenges in SSD Controller Design
- Transitioning Local Memory from DRR to OMI

Monday Evening, SNIA Reception

22 sessions already Tuesday morning!

Awards and Rewards

Lifetime Achievement Awards

2020 John Szedon (Today, 11:30AM)

2021 Yoshishige Kitamura, Eli Harari, Greg Atwood

SuperWomen in Flash Leadership Award

2021 Yan Li (Wednesday, 11:30AM; Peer Exchange 4:00)

Best of Show Awards (Wednesday, 6:30-7:00PM)

Closing Raffle (Thursday, 2:00)

Will You Help Us Improve and Grow FMS 2023?



Flash Memory Summit

Volunteer Recruitment
Wednesday, ~Noon, Booth #319
Thursday, ~10AM, Booth #913
Including expanding Diversity,
Equity, Inclusivity efforts and
DRAM
AMD Lounge #319
Pliops Lounge #913

Flash Memory Summit 2022
Santa Clara Convention Center
Halls A-D
Santa Clara, CA

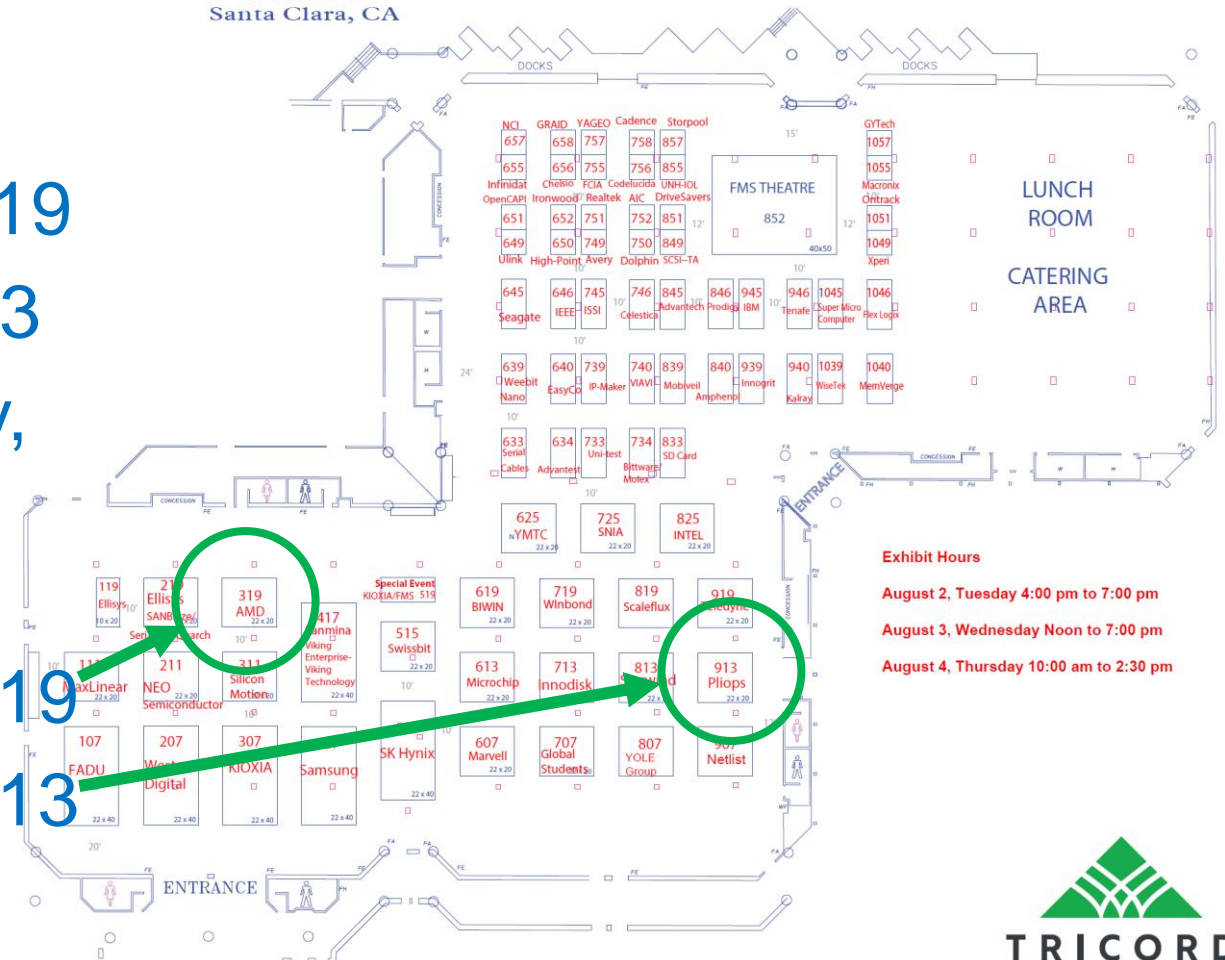


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Please Remind Session Chairs to Display the QR Codes for Session Surveys

Please take the Session Survey
Thank you!



Tuesday



Wednesday



Thursday

Thank You!



Flash Memory Summit

- Advisors
 - CAB: Conference Advisory Board
 - PEC: Program Executive Committee
- Speakers, Chairs, Organizers, and Backups
- Conference ConCepts Staff
- Chip Stockton

Thank You!

- For making FMS
 - Possible
 - The must-attend storage event of the year
 - The best networking opportunity in the industry
 - And, a lot of fun

@flashmem
#FMS2022

- Let's have a great, safe, inclusive event
- Prepare for a bright future!