4DS memory

A DISRUPTIVE TECHNOLOGY FOR STORAGE CLASS MEMORY

Investor Open Briefing – Feb 2018

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Welcome - Jim Dorrian

- Jim Dorrian is the non-executive Chairman of 4DS.

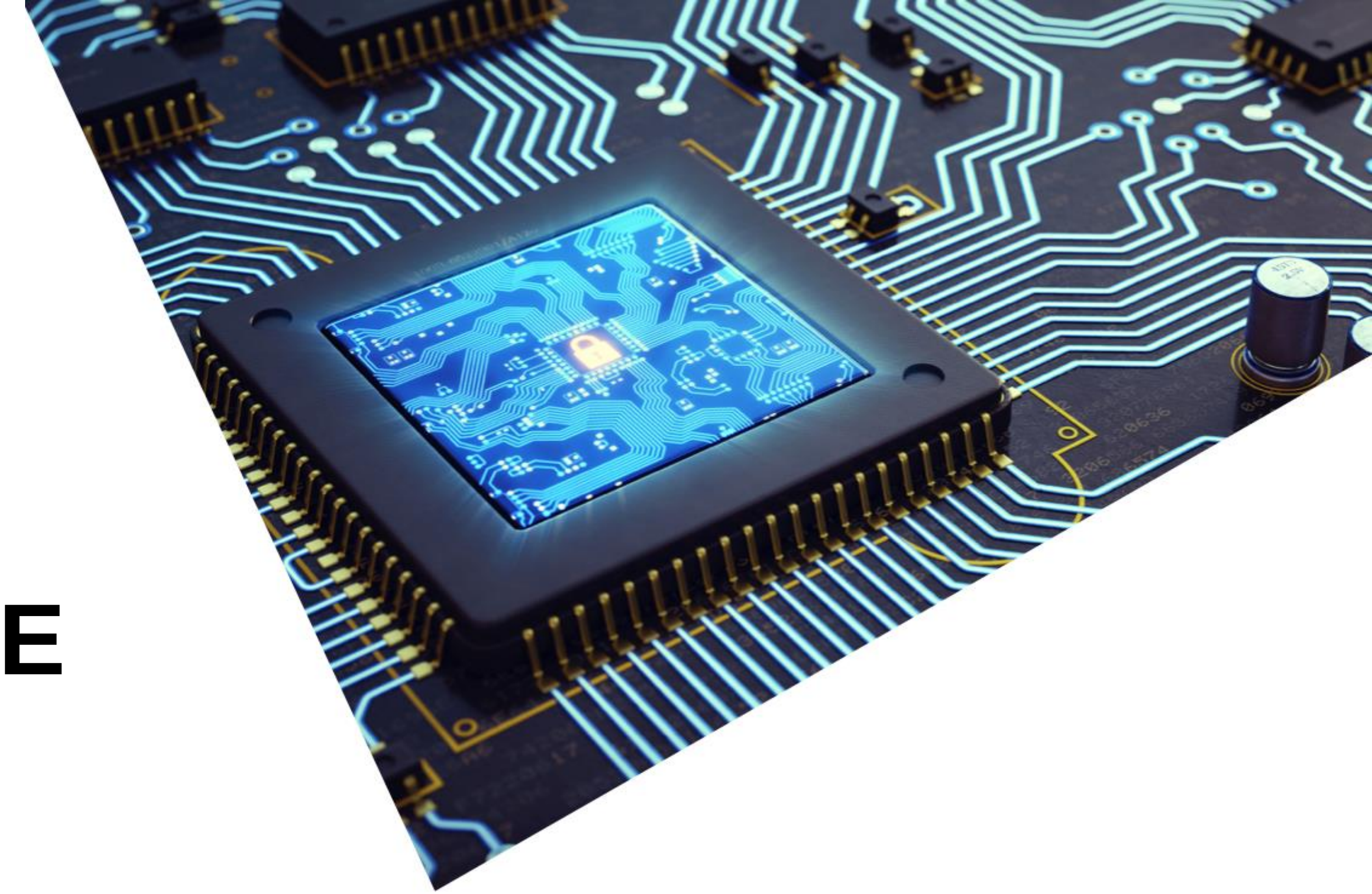
  Former partner at Crosspoint Venture Partners, a prestigious Silicon Valley VC firm.

  Been a CEO and Board Member of several multinational Silicon Valley companies.

  Holds a Bachelor of Arts in Economics and Communications from Indiana University.

- **Invested over A$1 mil cash in 4DS since taking Chair, more recently an additional A$250,000 in early 2018**
- **Substantial shareholder – over 50 million shares**
- **Has never taken any salary or fees – following ASX listing, directors fees are taken in scrip each year at June 30 price**
- **Has founded and exited Silicon Valley companies with cumulative exit value in excess of US$7 billion**

BillMeLater a PayPal service	Arbor Software	OnLink	DemandTec an IBM Company
US$1 billion	**US$4 billion**	**US$610 million**	**US$440 million**



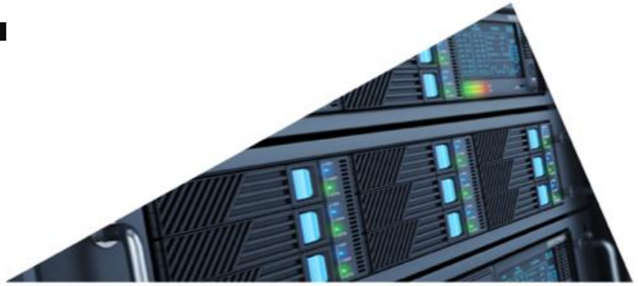
GLOBAL DATA EXPLOSION PRESENTS HUGE CHALLENGES.

The semiconductor industry recognises the challenge and is investing billions of dollars annually on research and development to create a solution.

THE CHALLENGE.+

DRAM and NAND Flash are the main technologies utilized today.

Both are US$40-50 billion annual markets – and growing.



DRAM is super-fast, has exceptional endurance but is expensive and volatile

NAND Flash is slow, has limited endurance but is cheap and non-volatile

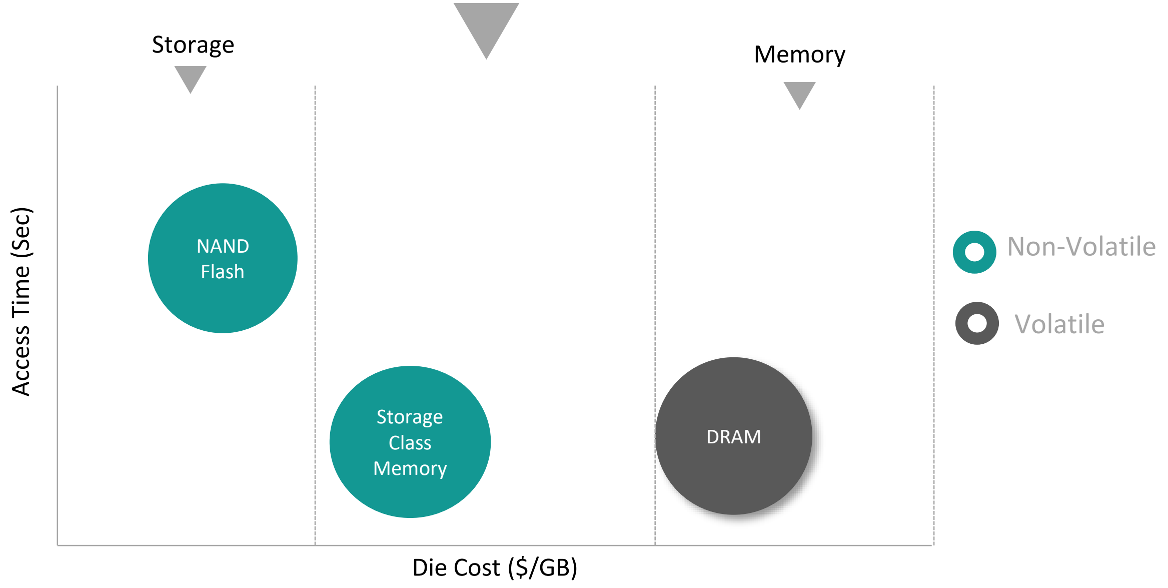
A new innovation is required and the industry refers to it as **Storage Class Memory** - over time this is predicted to have a market size as large as DRAM and NAND Flash

STORAGE CLASS MEMORY.+

Emerging as the leading new category to extend the memory hierarchy.

STORAGE CLASS MEMORY

Combines the best characteristics of DRAM and NAND Flash

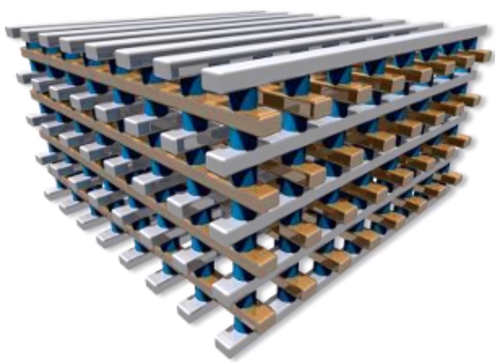


Battleground for next generation memory technology.

- **Faster** – DRAM-like read speed
- **Cheaper** – NAND Flash-like costs
- **Non-volatile** – Retains data when power is off

THE STORAGE CLASS MEMORY SOLUTION.

4DS memory INTERFACE SWITCHING ReRAM



- **World-leading** Silicon Valley based Interface Switching ReRAM developer
- 4DS is the most **advanced Interface Switching ReRAM**
- **19 US patents** developed and granted and 4 pending
- **The most promising Interface Switching ReRAM cell for Storage Class Memory**
- **Joint development agreement** with Western Digital subsidiary HGST since 2014
- **Strategic collaboration with** imec signed in November 2017
- Successful placement/option exercise in November 2017 raised **A$3.83 mil**

STORAGE CLASS MEMORY REQUIREMENTS.+

Requirements

- Based on well-understood physics to be sustainable over generations
- Area based to achieve cost and density as close as possible to NAND Flash
- Capable of speed comparable to DRAM
- Endurance suitable for Storage Class Memory
- As much retention as possible to meet Storage Class Memory requirements
- As much retention as possible without sacrificing speed and endurance
- Tunable technology in the vast opportunity between DRAM and NAND Flash

STORAGE CLASS MEMORY REQUIREMENTS.+

4DS	Requirements
✓	• Based on well-understood physics to be sustainable over generations
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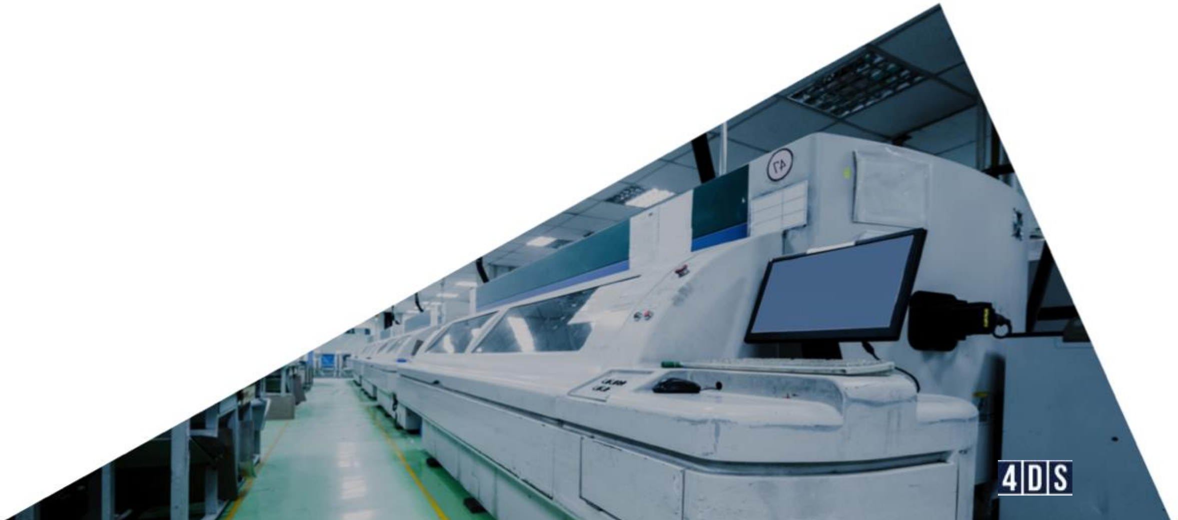
✓	• As much retention as possible without sacrificing speed and endurance
✓	• Tunable technology in the vast opportunity between DRAM and NAND Flash

PARAMETERS NEEDED MET.

4DS Interface Switching ReRAM has displayed enough relevant and meaningful data in each category **to now move immediately to production of a Megabit chip, a giant step forward**.

- Scales to geometries needed for high-density memory and 3D : 40nm memory cell
- Endurance far exceeds NAND Flash
- Endurance yield >97%
- Read speed comparable to DRAM – **an area-based ReRAM first**
- No need for speed crippling error correction – **a ReRAM first**
- Retention data adequate for Storage Class Memory



imec

COLLABORATION AGREEMENT.

imec, is the **world's #1** independent semiconductor development institute

- Collaborates with the who's who of electronic products and systems
- Collaborates with makers of high-volume high-density memories
- Has a world leading track record in the transfer of semiconductor processes
- Uses the same tools as industry for high-volume production of high-density memories
- Has a proven megabit memory platform to fast track development of Megabit chip
- Used this platform to explore a wide range of emerging memories

imec

COLLABORATION OBJECTIVES.

- Imec and 4DS have **already commenced** the 2018 development schedule
- End goal is to fabricate a megabit **4DS Interface Switching chip with a fully functioning memory**
- Develop a **fully transferable** fabrication compatible process
- **Mimic industry standard** high volume production
- Utilizing imec's proven megabit memory platform **reduces time and cost**
- Report technical progress to shareholders – more often upon significant developments

JOINT DEVELOPMENT AGREEMENT.

HGST, is a subsidary of Western Digital Corporation (US$27 billion market cap), the largest global leader in digital storage.

- Strategic innovator in emerging high growth technologies
- Commenced JDA in 2014 – **Renewed in 2015, 2016 and 2017**
- Insight into what is important in a data-centric world
- Siva Sivaram, Head of Memory at Western Digital, commented **“We are committed to ReRAM, it is scalable with greater density, lower cost and latency and longer endurance”***

**12/8/2016 EE Times – 14 Views from the Flash Summit*

SUMMARY.+

- 4DS is developing a **breakthrough Interface Switching ReRAM Storage Class Memory solution**
- **Significant progress to date is pivotal for Storage Class Memory**
- Four year strategic partnership with HGST, **leader in digital storage**
- **Imec** - strategic collaboration to develop megabit chip with the **world-leading researcher in nano electronics**
- Consistently achieves stated milestones
- **Strong patent portfolio with 19 granted patents** wholly owned and developed in-house
- **World-class team** of memory specialists, material scientists and test engineers
- Board experienced in founding, building and **exiting high tech companies**
- **Sufficient cash to meet current objectives**

4DS is addressing the massive memory demands of tomorrow

THANK YOU

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THE LEAP TO STORAGE CLASS MEMORY.

October 2016

Achieves Working
40nm ReRAM Cells

December 2016

Achieves
Endurance Milestone

4DS ReRAM Reaches Read
Speed **Comparable to DRAM**

June 2017

Renews
HGST Agreement

2nd Half 2017

imec Collaboration

- Focused on Megabit chip development
- Current retention data is sufficient
- A$3.83 mil placement / options exercised

Going forward

CORPORATE / TECH

- Strategic Partnership/s
- Development of Megabit chip

BOARD AND MANAGEMENT.+

Global expertise founding and building high-tech companies.

JIM DORRIAN

Non-Executive Chairman

- Served as CEO of several Silicon Valley companies
- Extensive M&A experience
- Partner at VC firm Crosspoint Venture Partners

Last transaction was the sale of Bill Me Later – a company Jim founded and sold to **PayPal for US$1 billion**

Dr GUIDO ARNOUT

CEO & Managing Director

- 30+ years in commercialising electronics technology
- Successes include, Power-Escape, CoWare, CrossCheck Technology and Silvar-Liso

HOWARD DIGBY

Non-Executive Director

- Former senior roles at IBM, Adobe, Gartner and the Economist Group
- Non-Executive Director Elsight Ltd and Chairman of Omni Market Ltd
- Advisor to a number of early stage technology companies

Dr SESHUBABU DESU

Chief Technology Officer

- Expert in thin films, semiconductor processing and non-volatile memories
- Professor, Dean and Head of Electrical Engineering at various universities

DAVID McAULIFFE

Executive Director

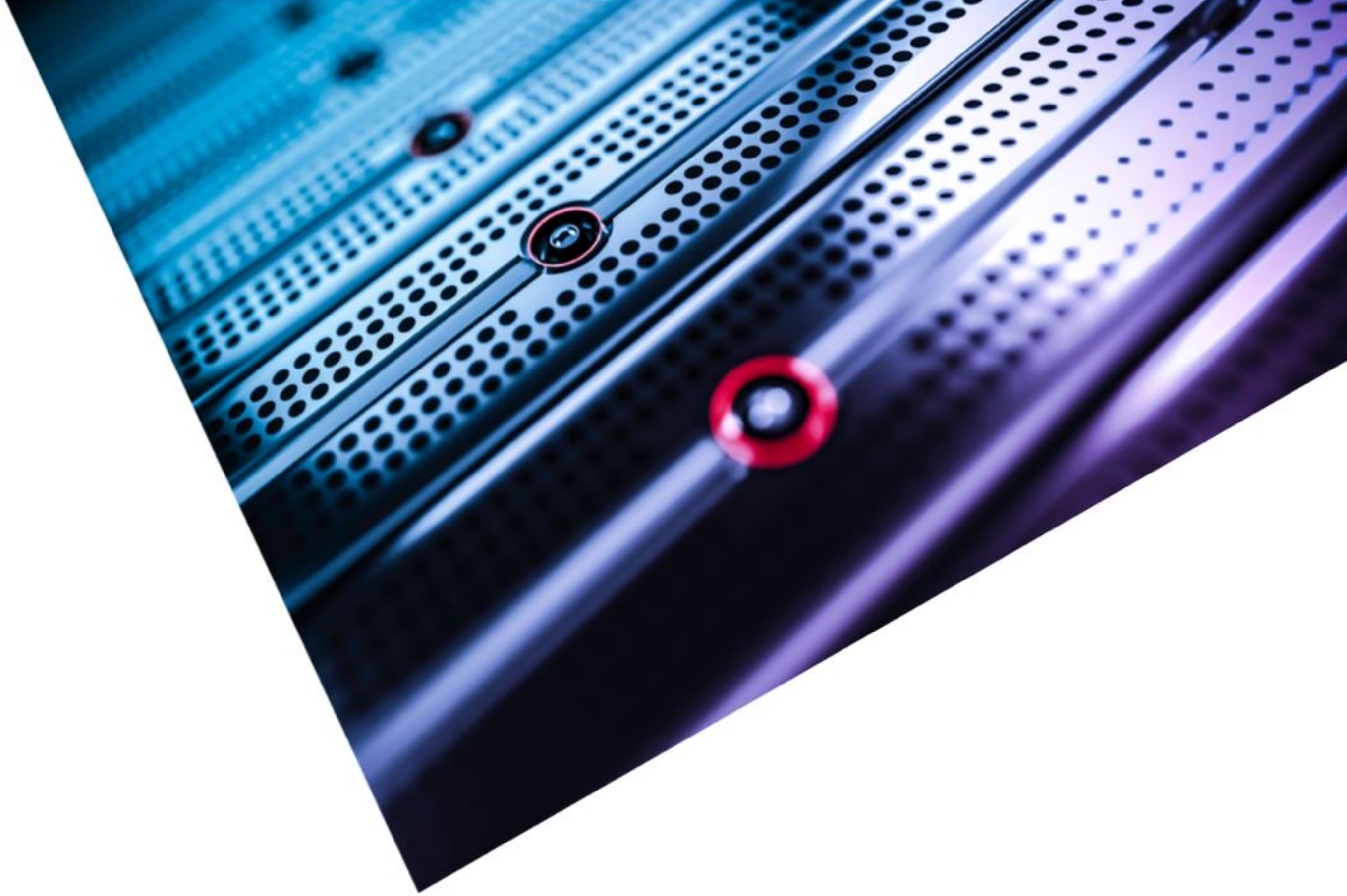
- Experienced company director
- Involved in numerous capital raisings and in-licensing of technologies
- Founder of several companies in Australia, France and the UK, many of which are now ASX listed

MICHAEL VAN BUSKIRK

Chief Engineering Officer

- Executive roles with a number of leading memory companies in Silicon Valley
- These include, Adesto Technologies Corporation, Innovative Silicon Inc and Spansion Inc.

CAPITAL STRUCTURE.



ASX Code	4DS
Market Cap (Fully Diluted)	A$86 Million*
Ordinary Shares on Issue	942 Million
Unlisted Options	124 Million
Cash	~A$4.5 Million – Feb 2018
Board and Management	15%
Top 20	33%

* As at 2nd Feb 2018