Mempile's TeraDisc™ Technology

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Presentation at OSTA

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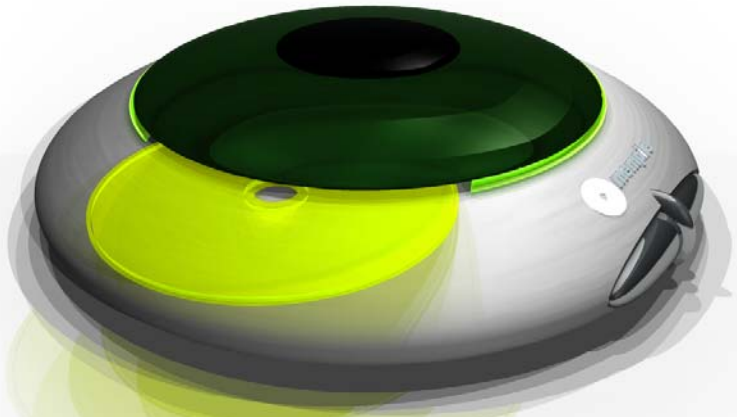
Topics

- Overview of Mempile
- The Market and Mempile's Value Proposition
- Technology Overview
- Roadmap



Company Overview

- **Technology Area:** **Revolutionary two-photon, high-density, optical storage medium and drive technologies enabling >1TB cost-effective and durable archiving storage on a 120mm disc**
- **Founded:** **May 2000**
- **Presence:** **Israel (HQ/R&D/S&M), Japan (Bus. Dev.)**
- **Employees:** **30**
- **Funding:** **Over $30M of venture capital and strategic partner funding**

Why Two-Photon Technology?

- Capacity
  - **500GB, 1TB, 5TB roadmap on a single TeraDisc™**
- Media
  - **Volumetric with a roadmap to 5T on a single disc**
  - **Easily and inexpensively produced with or without a cartridge**
  - **Data longevity >50 years**
  - **Natural successor to blue laser technologies for archival storage**
- Drive
  - **Based on existing drive technology**
  - **Functions in normal home/office environment**
  - **Able to reach consumer form factor over time**
- Price
  - **Lowest cost/TB predicted for 2010 for archival storage**

Over 100 million TB
created annually
in the US home from 2010

Two-photon technology is capable of changing the rules of the game

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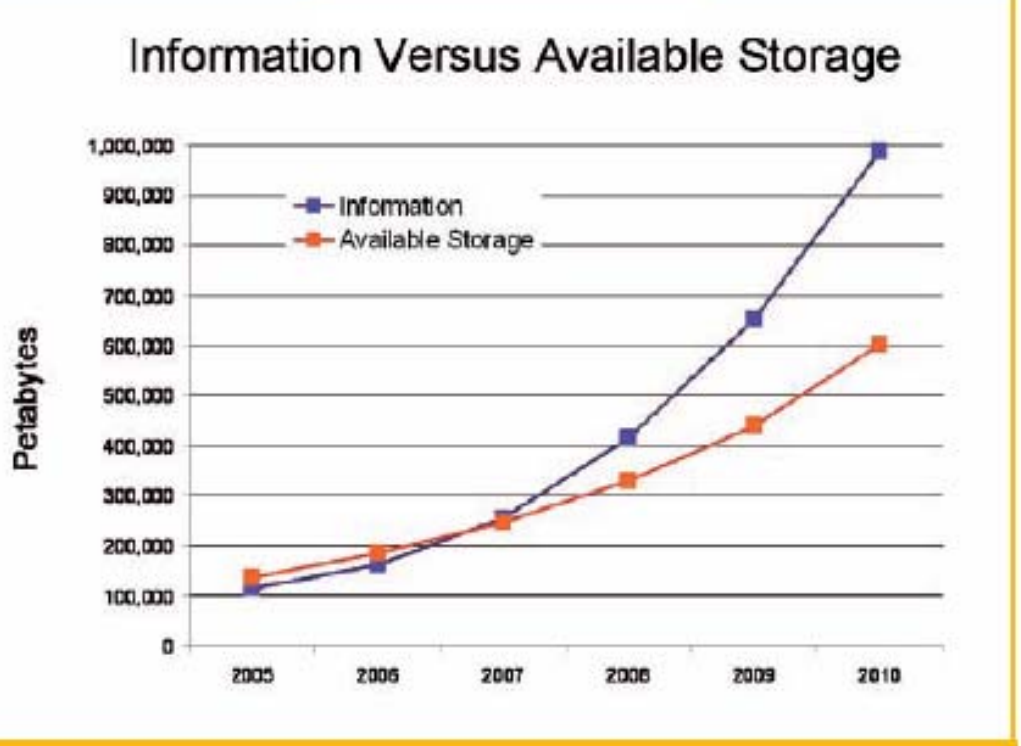
The Market

Information Outstrips Storage Capacity

Figure 2



Source: IDC, 2007

Source: 'The Expanding Digital Universe: A Forecast of Worldwide Information Growth Through 2010' , IDC for EMC, March 2007.

In 2010, 988 exabytes of information will be created but with only 600 exabytes of available storage capacity

SME and Professional

- **Compliance**
  - Medical Records
    - *HIPAA Compliance*
  - SME
    - *Network logging*
    - *Email archiving (SOX Compliance)*
- **Entertainment**
  - Broadcast libraries
  - Compliance recording
  - Film and video archives
  - Production distribution
- **Security**
  - Video Surveillance
- **Government Archives**

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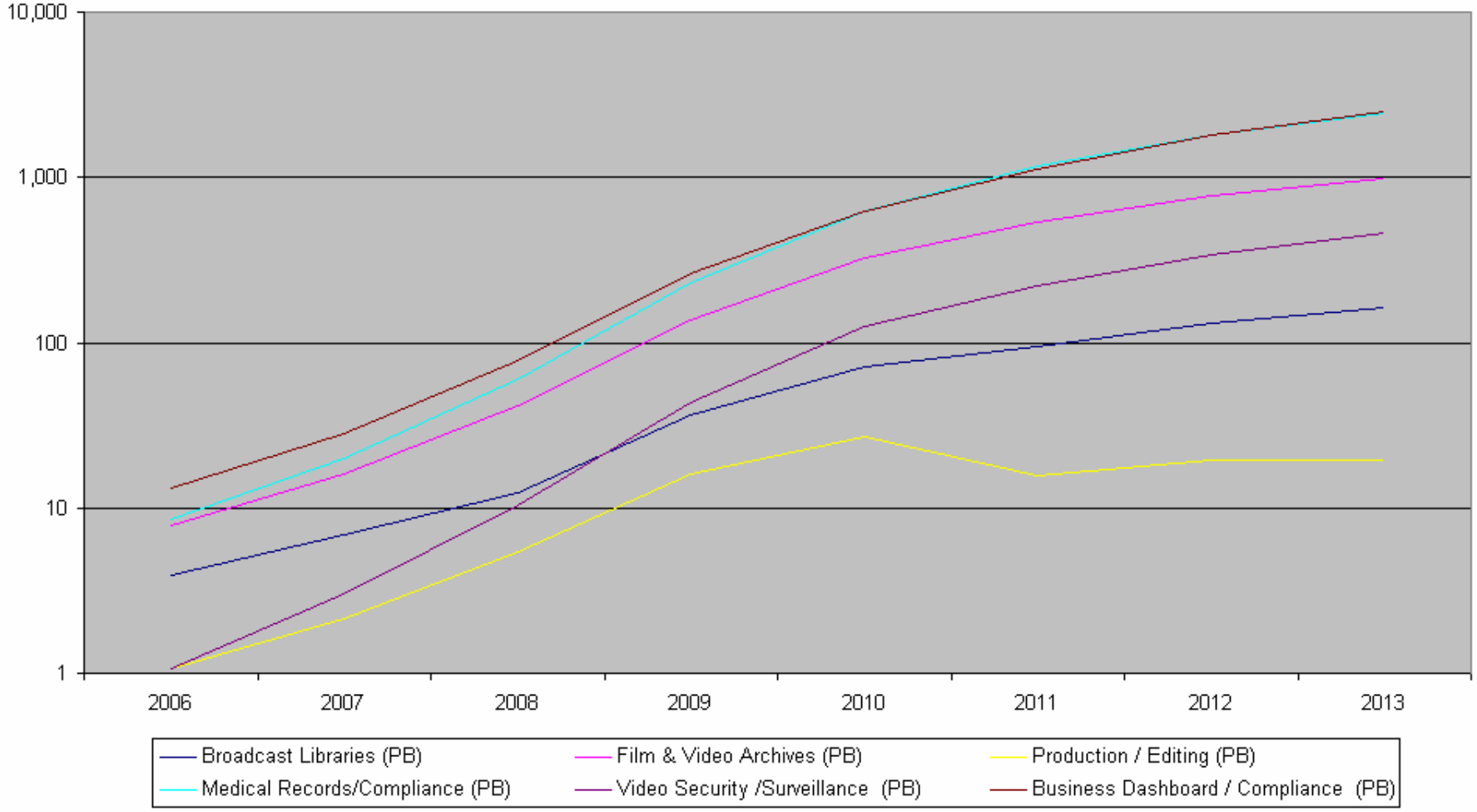
Petabyte Archival Ultra Density Optical Storage



Source: Wintergreen, 2007

Mempile Enterprise Proposition

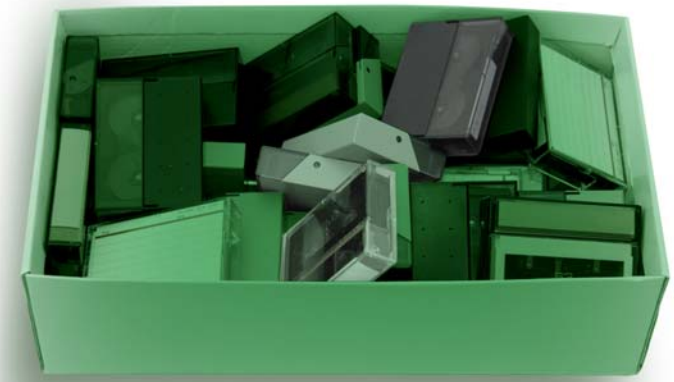
- Professional and Enterprise Archiving Markets

  - **Currently moving to blue laser (and off-the-shelf consumer drives) for markets such as: business and financial compliance, healthcare, video surveillance, media archiving, and more**
  - **Mempile's TeraDisc capacity exceeds the volume of alternative optical solutions**
    - ***Fully removable for near-line and off-line archiving***
    - ***Scaleable cost effective archiving***
    - ***Lower total cost of ownership per TB than all future archiving technologies***
    - ***As much as is possible, is being designed to utilize existing standards for manufacturing and physical infrastructure and methods***
    - ***Easily integrated into turnkey archival systems***

Personal Media Archiving

- Aggregating your digital islands
- Putting your digital media in a digital shoebox

  - Digital photos
  - Digital videos
  - PC backups
  - PVR content
  - Internet content
  - And more…..



Mempile Consumer Value Proposition

- Personal Media Archiving

  - **Terabyte capacity allows centralized storage of all media in the home**
  - **Easy to handle, fully removable and storable for greater than 50 years in normal physical environment**
  - **Lower cost-per-gigabyte**
  - **Bit-by-bit serial recording makes it easily integrated with home networks**
  - **Designed to incorporate on-media or on-drive DRM schemes**
  - **Cost of drive will be able to be brought down to consumer level**

Growing Importance of Personal Content

- By the next decade there will be more personal than commercial digital content stored
- This will create new markets and opportunities to serve this diverse and dispersed market
- Increasingly consumer electronics will be driving new technologies in addition to enterprise applications
- Storage demand is infinite—we can't keep enough information—as long as we can find, keep and preserve it

Source: Coughlin, 2007

By 2015

- A terabyte in your pocket
- A petabyte in your home
- Exabytes in datacenters
- Zetabytes in the world

2007 Storage Visions Conference

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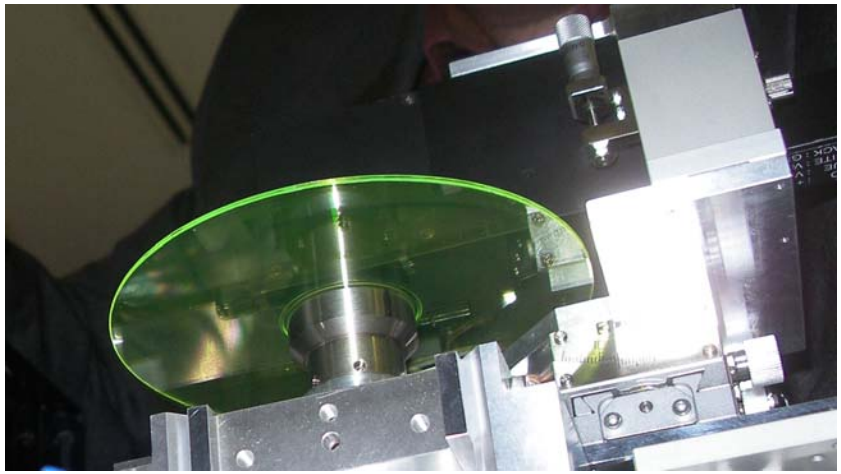
The Technology

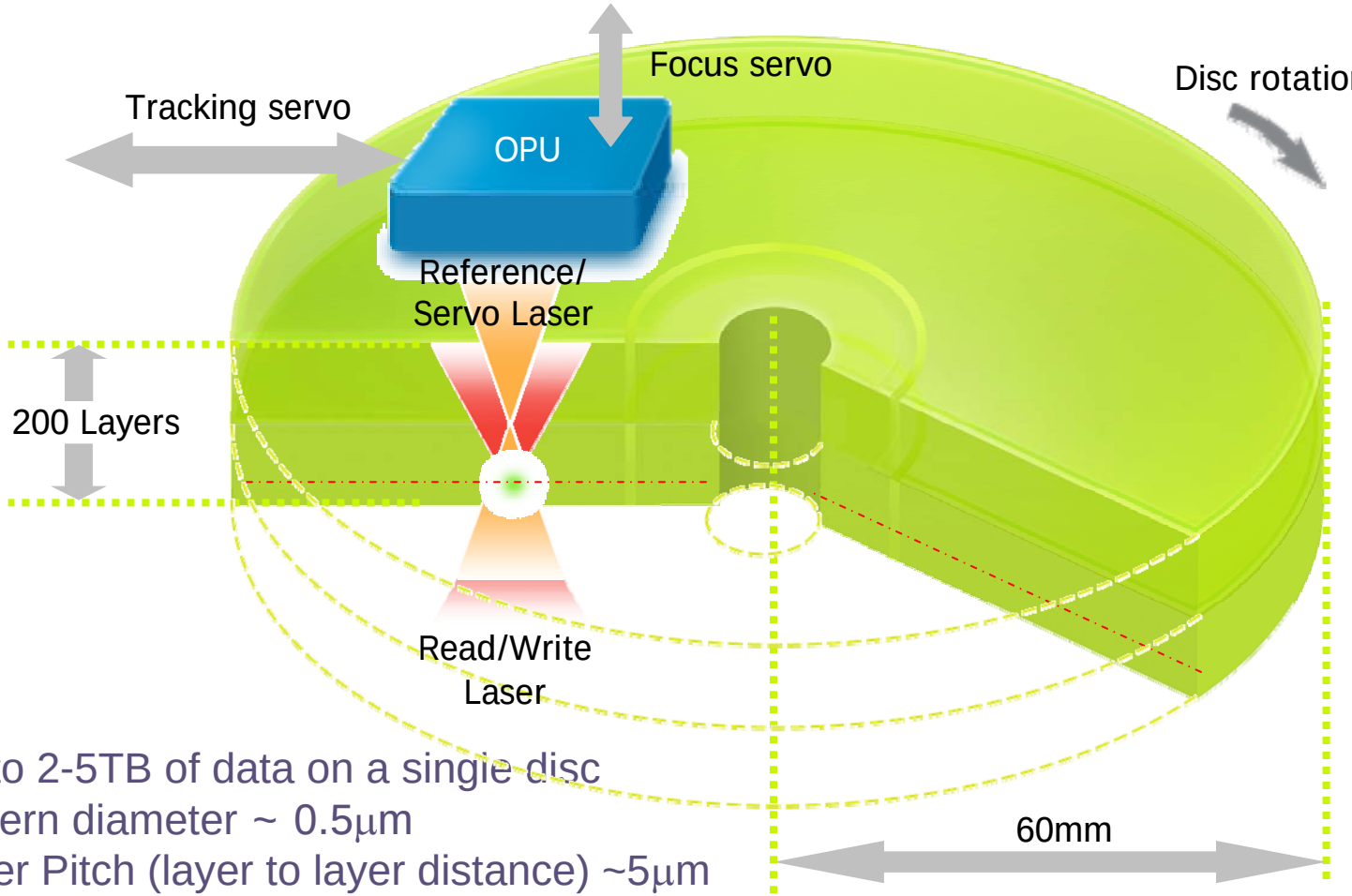


TeraDisc™

Technology Summary

- Optical Disc
  - **Bit-by-bit two-photon volumetric serial recording**
  - **3D Data Access**
  - **Organized in multiple layers maximizing the utilization of volume of the media.**
  - **Simple plastic disc inexpensively produced**
  - **True write once media ('Permanent WORM') ensuring data authenticity**
  - **High data integrity (low bit error rate)**
  - **True random data access with quick access/seek speed**
  - **Direct read after write**
  - **Re-uses existing disc manufacturing infrastructure**
- Optical Disc Drive
  - **Requires high-power laser (640-680nm wavelength)**
  - **Re-uses existing drive components and manufacturing infrastructure**
  - **Redesign of servo and OPU**

Schematic Two Photon system

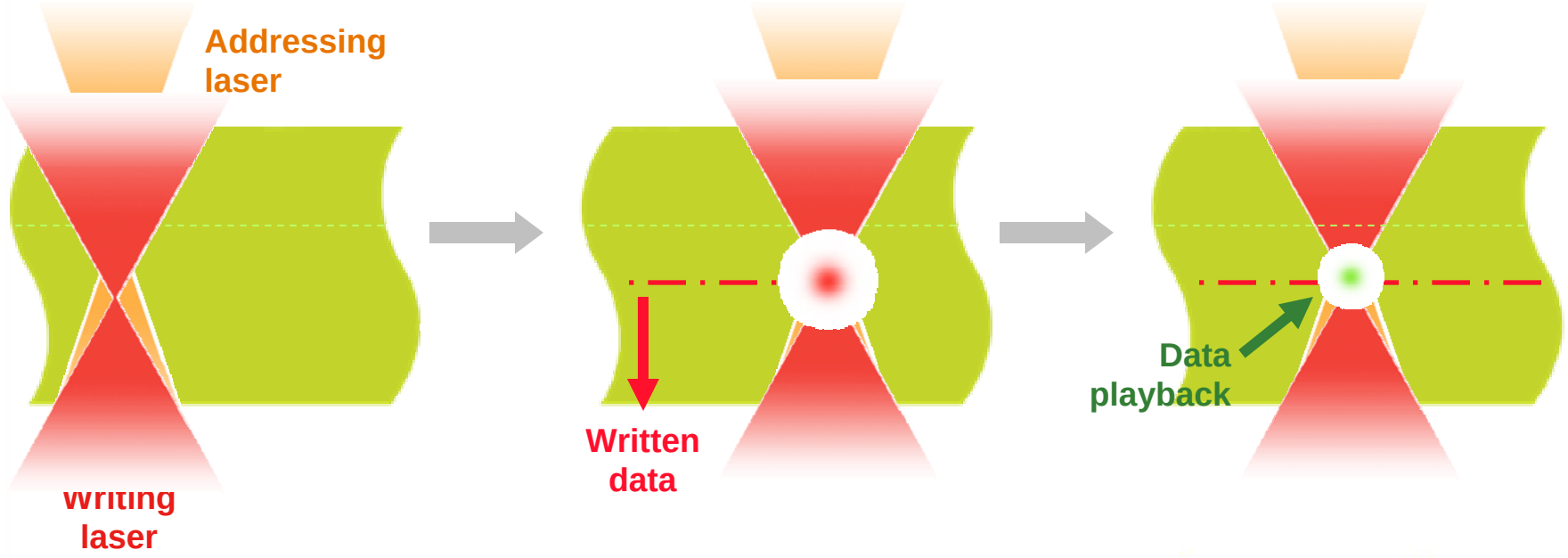


- Up to 2-5TB of data on a single disc
- Pattern diameter ~ 0.5µm
- Layer Pitch (layer to layer distance) ~5µm
- DVD like design and components

On a 2 mm disc Mempile can store 1 TB on a DVD-like system

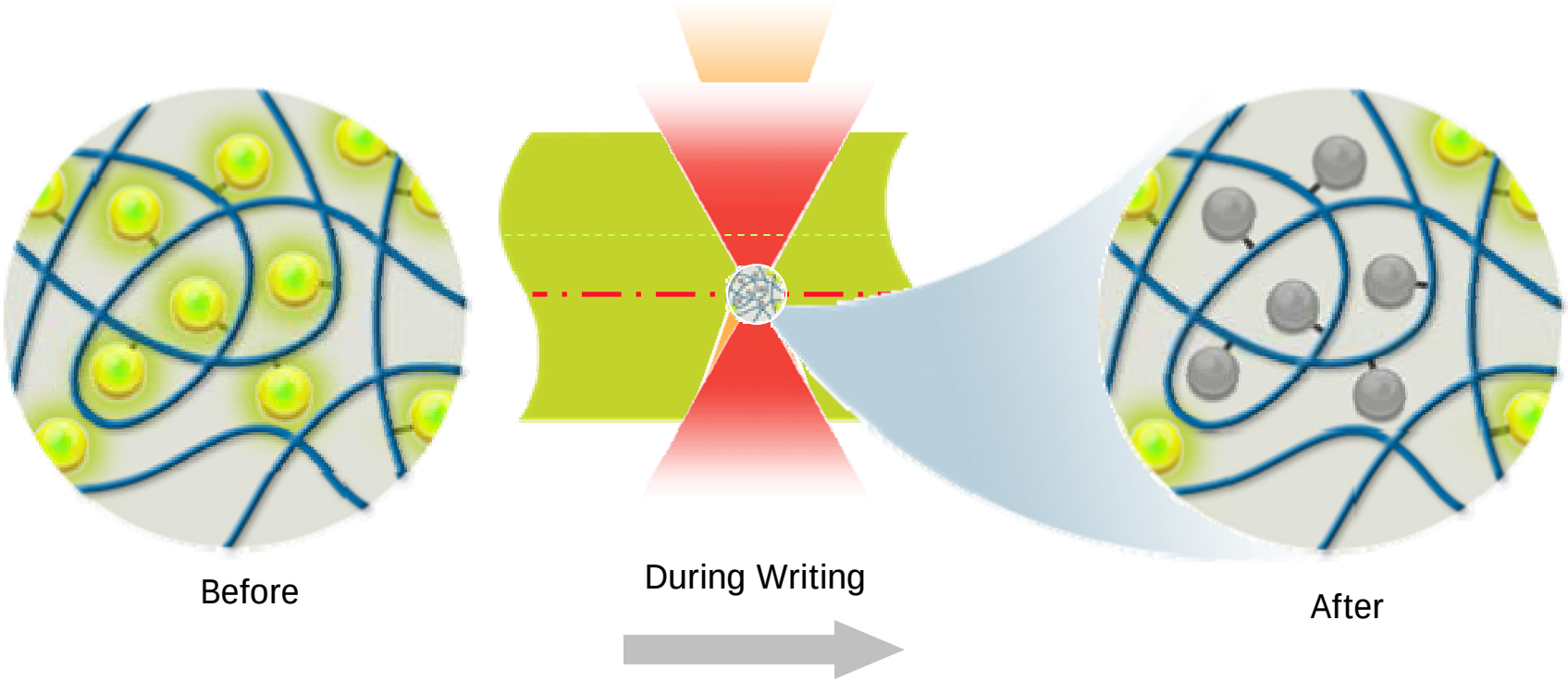
Mostly conventional optical recording

- **Data is written bit by bit**
- **Data is organized in layers**
- **Only a small number of servo layers are required**
- **Reading and writing using red laser**
- No decrease in signal quality, focus quality, SNR, CNR between layers



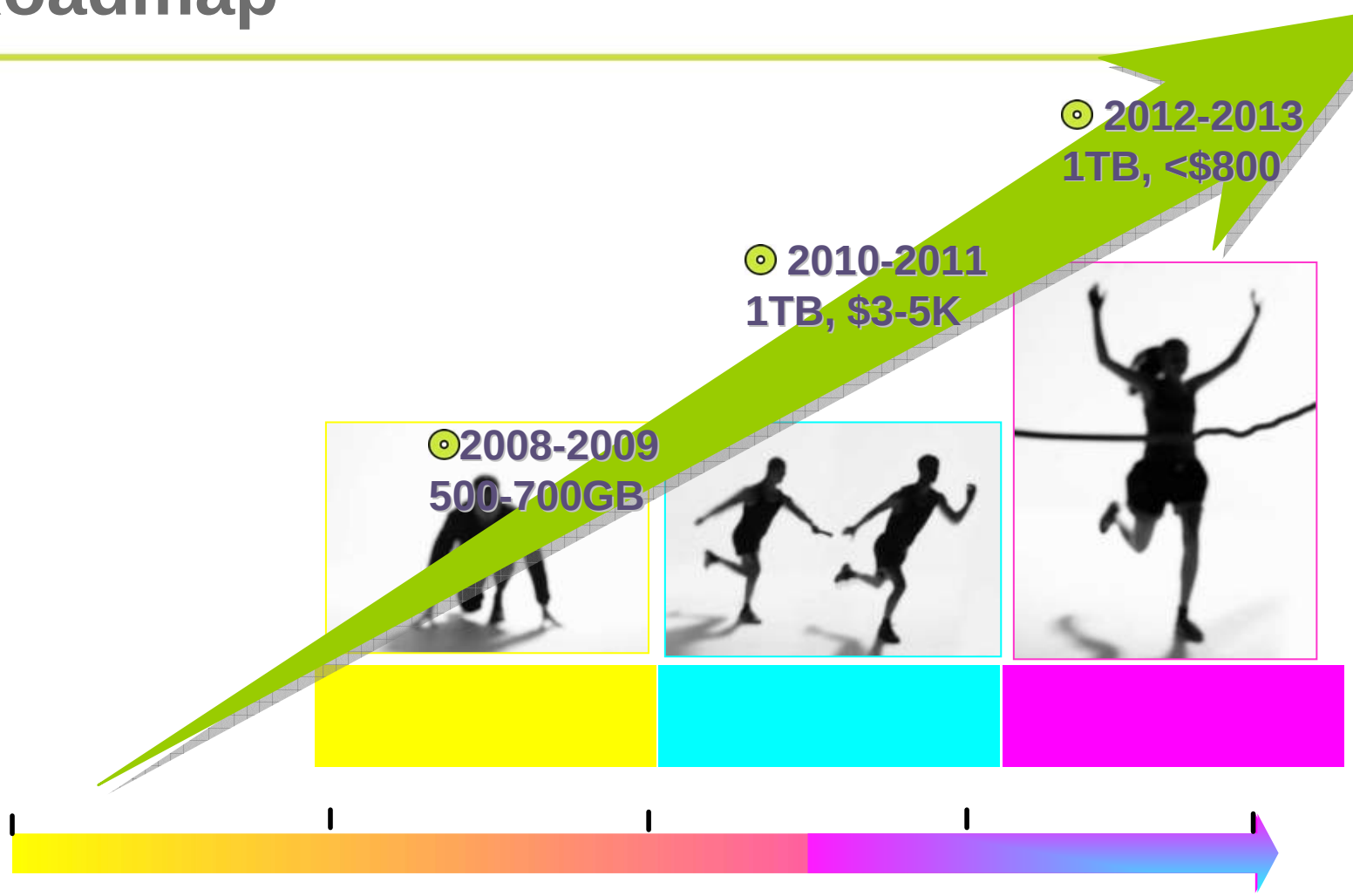
Two-Photon Chemistry

A **polymer (plastic) backbone** **(for physical properties)**
attached through short **spacers** **(for free movement)**
to **Chromophores** **(for data storage)**



Note: each “data pattern” includes hundreds of millions of chromophores

Roadmap



How to Get There

- Ongoing development at Mempile and licensing of the technology
- Working with partners to create a robust, mass-producible optical disc
- Working with component and drive manufacturers to produce drives

The Bottom Line

- Fill a void for consumer archival storage
  - Low cost, high capacity, removable, permanent and easily integrated into a home network
    - Strong patent portfolio
      - First-mover advantage to initial partnerships with Mempile

Ideal technology to replace, supplement , enhance and encourage high-capacity archiving solutions.

Thank you!

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