



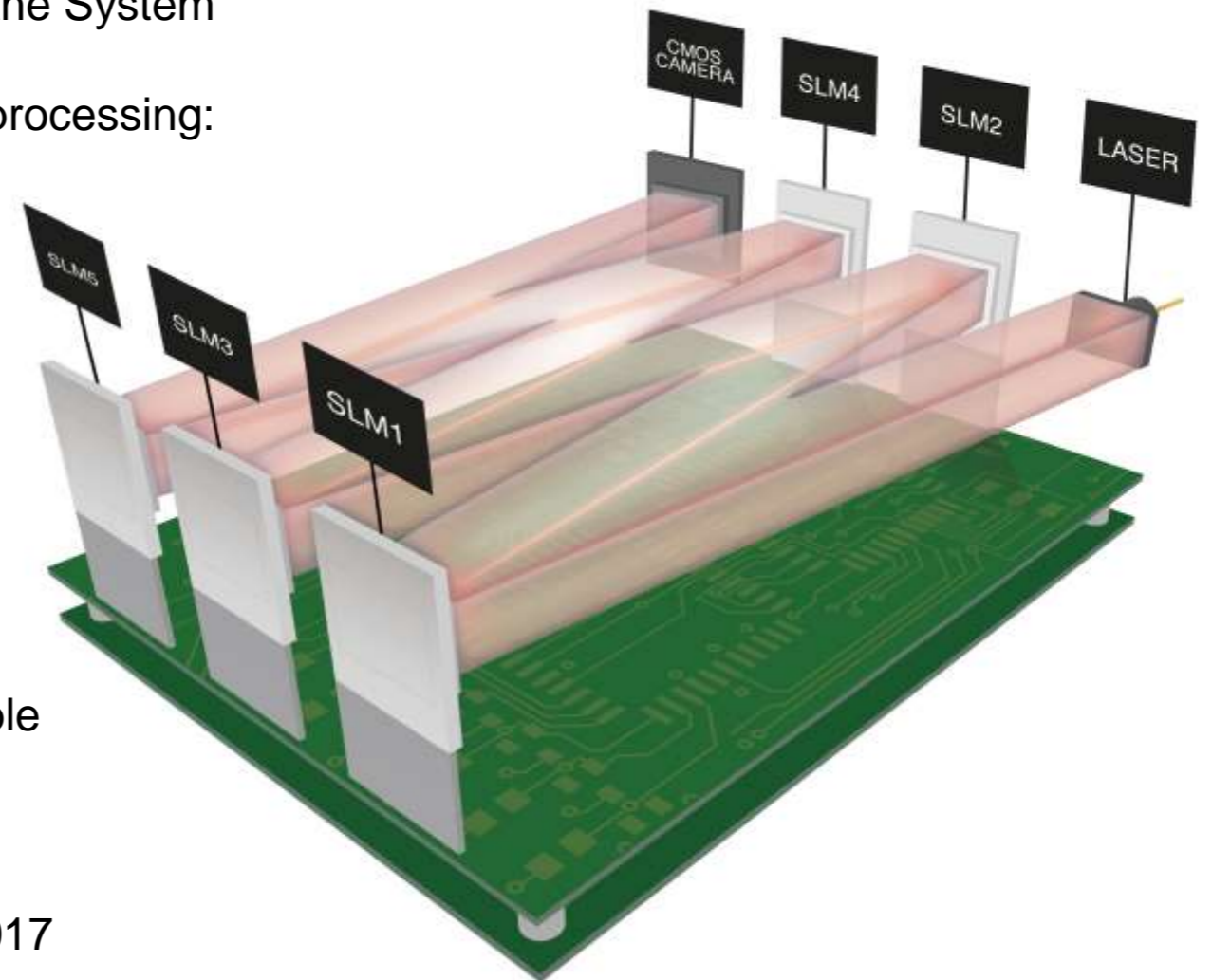
**IDC HPC User Forum
Denver, USA**

8-10 September 2015

Optalysys Optical Processing Technology

Turbo Charges Existing Desktop and HPC Systems

- Means to calculate Fourier Transform and Linear Algebra Operations Optically
- Massively Parallel Calculations performed at the Speed of Light
- OFT Analogous to 2D FFT, but resolution may be scaled without affecting process time
- High Resolution, fast (eg 4Kx2K, resolution, >2kHz) Liquid Crystal Microdisplays (SLMs) enter Numerical Data and Focus the light Around the System
- Addresses fundamental limitations of high-end electronic processing:
 - Power Consumption
 - Speed
 - Resolution
 - Data Management
 - Disruptive Pricing
- 2 Main Application Areas:
 - Big Data Volume analysis (correlation)
 - Model generation (partial derivatives)
- Complimentary, Modular, Rugged, Reconfigurable, Scalable
- Based upon well established principles
- Standalone/Integrated Co-Processor: First Product end 2017

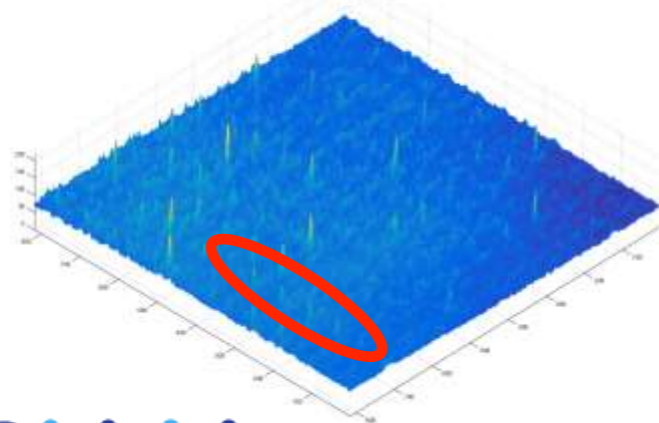


Main Areas of Development

GENESYS Project: Bioinformatics

- Will perform alignment searches to identify patterns in nucleotide and protein sequences
 - “Out of the box” searches including BLAST, BWA, Exonerate, Bowtie, Clustal, Muscle and others
 - Open interface for third party applications
 - Exact and similarity searches
 - One to One, One to Many, Many to One and Many to Many
- 95% energy savings and 20x faster processing than a single 32 core HPC node.
- 2 year collaboration ending 31st May 2017
- £800,000 UK Government funded project

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GGCCCATAGTG  
GTTTAGAATGC  
TAATGCCCTAG  
ACGCTACGTAT  
GCTCCTGATCG  
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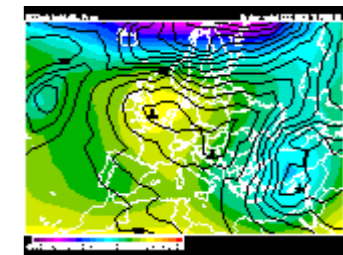


TGAC
The Genome Analysis Centre™

“”
Optalysys are the only company with the proven technology and expertise to realise our vision and we are excited to be in partnership with them

ESCAPE Project: Energy-efficient Scalable Algorithms for Weather Prediction at Exascale

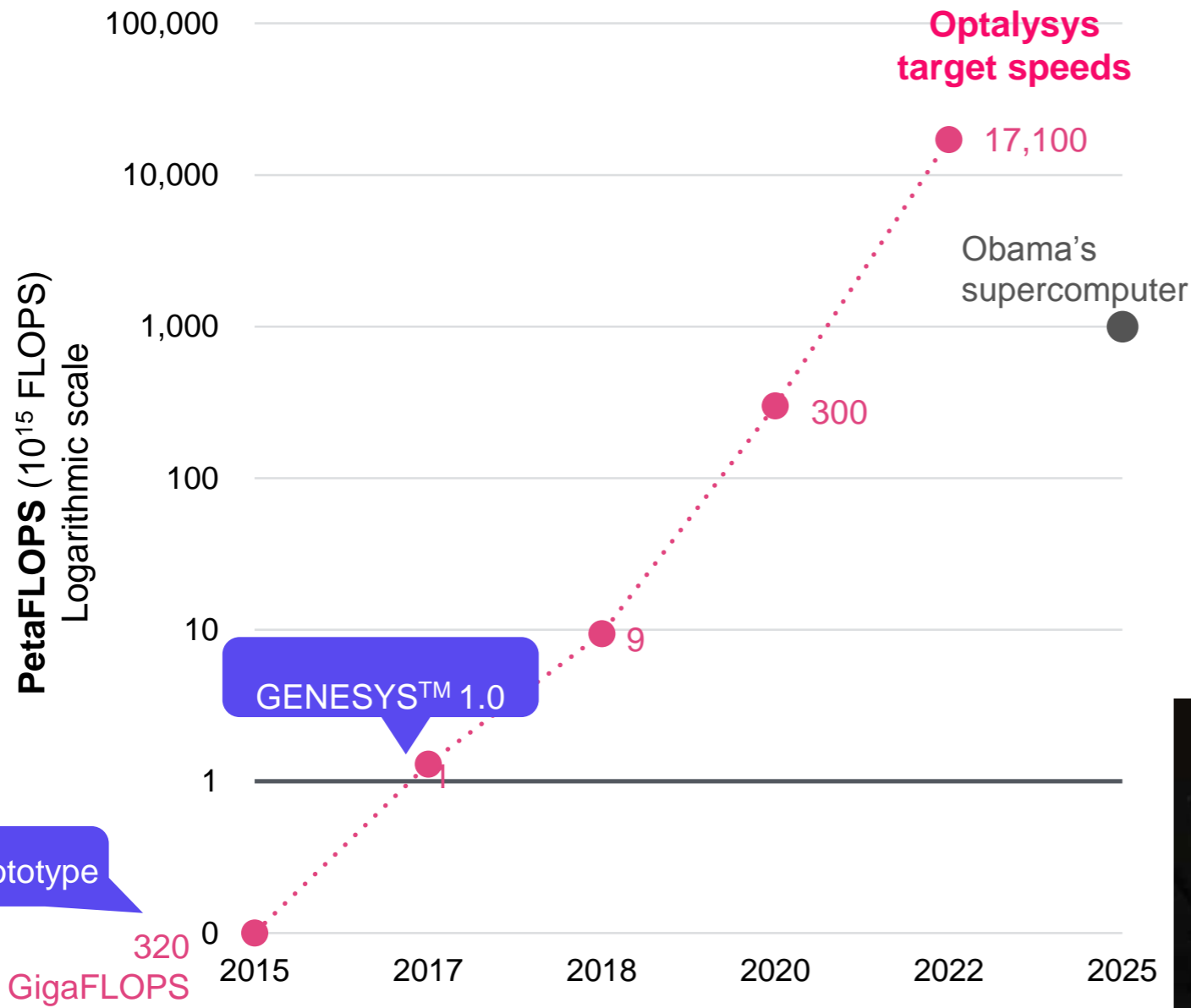
- To create next-generation weather forecasting on exascale computers
- Design for an exascale solution
- A proof of concept optical co-processor to a Nvidia GPU working within a CRAY system
- Major European consortium led by ECMWF
- 3 year project starting Oct 2015 involving our CFD expert and dedicated pHd student
- €4m grant from European Commission’s Horizon 2020 programme



ECMWF

“”
ECMWF is hugely supportive of this proposal. It is clearly an exciting novel technology path to more scalability

Roadmap



Today

- TRL4 Prototype
- Scalable, lensless design without alignment issues

2 years

- GENESYS™ product launches for bioinformatics market
- Scaled up in pixel count & frame rate

2022

- 50k resolution device is capable of boosting performance to multi-exaFLOP speeds.

