Integrated Photonics
POET’s Optical Interposer Platform

The MicroCap Conference
New York, NY April 9-10, 2018
Safe Harbor

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Photonics – the technology of generating, transmitting or detecting photons (visible and invisible light)

Indium Phosphide (InP) and Gallium Arsenide (GaAs) - materials that emit photons when charged with electrons

Integration – putting more functionality in fewer devices – usually to lower cost, but in some cases to do new things

Transceiver – a device that transforms electrical signals (usually conducted over copper) into photonic signals

Optical Engine – the bits of the Transceiver that emit, detect and manage the photons, not including electronics or housing

Optical Interposer – POET’s approach to integration and how we package the Optical Engine
Photonics is a part of everyone’s life today

**Photonic Sensing**
- Guidance & Navigation
- Test & Measurements
- LIDAR systems
- Medical & Healthcare
- Oil & Gas

**Data Communications**
- Telecommunications
- Optical communications
- Server to server
- Rack to rack
- Data center to metro
We are an Integrated Photonics device company.

- **75** Employees
- **58** Patents
- **03** Technology Platforms
- **02** Operating Subsidiaries

- **Indium Phosphide (InP)**
  - Lasers, SLEDs, ELEDs, modules for optical sensing
  - Hybrid Integrated Photonics Packaging (HiPP)

- **Optical Interposer Platform**
  - Passive Dielectric Waveguides

- **Gallium Arsenide (GaAs)**
  - Active Optical Cables

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**Publicly Traded** – TSX Venture (Canada) – PTK.V

- **Admin, Design, and Lab**
  - Silicon Valley, California

- **Corporate HQ**
  - Toronto, Canada

- **Design, Fabrication and Testing**
  - Changi Road, Singapore

- **DenseLight Semiconductors**
  - Singapore

- **BB Photonics**
  - UK

- **POET QX (US)**
  - POETF (SEC Compliant)
2018 Announcements

✓ 2 New Board Members:
  • Don Listwin – ex Cisco Systems
  • Peter Charbonneau – ex Skypoint Capital, Newbridge Networks

✓ 2 Major Technical Achievements:
  • Quad PIN Detector – 100G capable and 400G potential
  • Optical Interposer – true platform technology

✓ 2 Major Partnerships:
  • Accelink Technologies - for development of 100/400G transceivers
  • SiTerra Malaysia - foundry for production of Optical Interposers
Data Communications market fueled by growth of the Internet

Source: Cisco VNI Global IP Traffic Forecast; 2016-2021

Old phone Kbps
Home Mbps
Datacenter Gbps
Front plates Tbps
Traffic
Traffic Today
Traffic Tomorrow
Kilo = 10^3
Mega = 10^6
Giga = 10^9
Tera = 10^{12}
Peta = 10^{15}
Exa = 10^{18}
Zetta = 10^{21}
Yotta = 10^{24}

24% CAGR
2016-2021

Gaming
(1%, 4%)
File Sharing
(8%, 3%)
Web/Data
(18%, 11%)
IP VOD
(22%, 14.5%)
Internet Video
(51%, 67.4%)

300
250
200
150
100
50
0

Exabytes per month


2016-2021

Data Communications market fueled by growth of the Internet

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Mega data centers require **new technology**

Need smaller, faster, cheaper and lower power **integrated photonic transceivers**

A single Mega data center (500,00 sq. ft.) is estimated to require

~700,000 **100G** long reach transceivers @ **$250 ASP = $175M**

*Source: Needham & Co., Research Note on AAOI, May 22, 2017*
Integrated photonic transceivers will dominate the market

Integrated transceivers forecast to

$20 Billion by 2025

from

$3.2 Billion today

surpassing current discrete-based devices in 2021

Integrated Transceivers Sales Forecast

Source: Oculi, llc
POET Optical Engines address top two transceiver market segments

Ethernet Data Centers
<1km reach both within and between data centers

Wide Area Networks
(Metro – intermediate) served by 1km - 10km links

Serviceable Available Markets (SAM)

CAGR 27%
2017 - 2021

<table>
<thead>
<tr>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
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<tbody>
<tr>
<td>Value</td>
<td>$1,000</td>
<td>$2,000</td>
<td>$3,000</td>
<td>$4,000</td>
<td>$5,000</td>
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</tbody>
</table>

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Why Integration Matters

- Packaging and testing are a large fraction of BOM cost of conventional Photonics devices
- Integration of devices is the only effective means to:
  - Improve size, power, cost, speed, reliability and scalability
  - Enable new functionalities
  - Drive disruption in optical communications

Approximate Breakdown of Transceiver Costs

- Transceiver Margins: 30%
- Bill of Materials (BOM): 70%
  - Electrical Components: 25%
  - Optical Components: 30%
  - Packaging: 45%

POET’s Optical Engine reduces BOM Cost of Transceiver by >50% = >100% Margin Increase
Inside a typical 10G transceiver module
Replacing the Transmit and Receive Assemblies with a 1mm x 3mm Optical Engine from POET
POET’s Optical Interposer Technology

Optical Interposer

Electrical Interposer

Optical Layer

Electrical Layer

Electrical Interconnections
POET’s Optical Interposer Platform

A multi-purpose integration platform with unique benefits for transceiver manufacturers in datacom and telecom

Optical Interposer Platform Functional Advantages:

- Wafer-level integration into silicon
- Waveguides formed and integrated with embedded passive optical components (SSC, mux-demux, filters, waveguides) at chip level
- Ultra low loss waveguide dielectric with high coupling efficiency
- Pick and place assembly and passive alignment of components using x-y-z stops
- Elimination of lenses and active alignment
- Athermal waveguide dielectric allows multi-channel scalability
- Wafer-level hermetic sealing, testing and burn-in of active components to produce known good die
- Small form factor and platform architecture readily scalable
- High frequency metal traces managed in the dielectric platform
- Fully compatible with conventional CMOS processing allowing integration with complex electronics at chip or module level

Customize the POET Optical Interposer Platform to improve yields, lower cost of packaging, test and assembly, improve reliability, scalability and time to market.

Other waveguide technologies [Glass, Silica, SiN] don’t have the capability to INTEGRATE with Si CMOS
Broad Range of Applications

Data centers
Networking
Automotive
Industrial Sensing
High Performance Computing
Management Team

Dr. Suresh Venkatesan
CEO
25 years semiconductor industry experience
Motorola, Freescale & GLOBALFOUNDRIES
Technology Development & Commercialization

Thomas R. Mika
CFO
25 years semiconductor industry experience,
Tegal Corporation (NASDAQ: TGAL)
CEO and CFO leading IPO, several follow-on
financings and restructurings

Rajan Rajgopal
GM and President, DenseLight
Over 28 years of industry experience
Former VP at Global Foundries and Micron

David E. Lazovsky
Executive Chairman
Founder, CEO and Director of Intermolecular
(NASDAQ: IMI)
20 years of semiconductor industry experience - IMI and Applied Materials

Dr. William “Bill” Ring
SVP
20 years semiconductor industry experience:
HP, Tyco, BB Photonics
Optical technology, product and business
development

Dr. Yee-Loy Lam
CTO DenseLight
Co-founder of DenseLight Semiconductors
Professor Nanyang Technological University
Specialist in optoelectronics, fiber-optics
sensors and photonics systems applications
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Former General Partner, Skypoint Capital, funding early stage data and telecom co’s.
Board Member, Mitel and Teradici

Jean-Louis Melinge
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Partner with ARCH Venture Partners
Managing Director, YADAIS
Former CEO, Kotura
Leading expert in silicon photonics and optical components

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Director
Counsel to Stikeman Keeley Spiegel Pasternack LLP
Canadian attorney with 43 years of experience specializing in corporate and securities law

Don Listwin
Director
Founder, Listwin Ventures
Former CEO, Openwave Systems
CEO, Canary Foundation
Former EVP, Cisco Systems
Consulting Professor, Stanford School of Medicine

Chris Tsiofas
Director
Partner at Toronto Chartered Professional Accountancy firm Myers Tsiofas Norheim LLP
25 years of experience on both financial and operational issues

Mohandas Warrior
Director
President & CEO of Alfalight, 2004-2016
15 years at Motorola Semiconductors (Freescale) leading test and assembly operations
Recent “bought deal” public offering

Closed March 21, 2018
Underwriters: Cormark in Canada; H.C.Wainwright in USA

Shelf Offering in Canada
Private placement to qualified investors only in USA

25,090,700 Units
Gross Proceeds $13,799,885 CAD (US$10,663,548)

Unit = One Common Share plus 0.5 Warrant
Pricing $0.55 CAD (US$0.425)

Warrant Strike Price CA$0.75 (US$0.58)
Not separately tradeable
## POET capitalization and key statistics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total common shares outstanding</td>
<td>285,014,553*</td>
</tr>
<tr>
<td>Warrants Outstanding ($0.52 CAD)</td>
<td>34,800,000 (11/2/16 offering)</td>
</tr>
<tr>
<td>Warrants Outstanding ($0.75 CAD)</td>
<td>12,545,350 (3/21/18 offering)</td>
</tr>
<tr>
<td>Share price</td>
<td>$0.52 CAD** (US$0.40)</td>
</tr>
<tr>
<td>Market cap</td>
<td>$146.9M CAD** (US$113.2M)</td>
</tr>
<tr>
<td>52 week range</td>
<td>$0.18 – 0.79 CAD** (US$0.14 – $0.61)</td>
</tr>
<tr>
<td>TTM revenue (9/30/17)</td>
<td>$2.5M USD</td>
</tr>
<tr>
<td>TTM gross margin (9/30/17)</td>
<td>48%</td>
</tr>
<tr>
<td>Cash and short-term investment (9/30/17)</td>
<td>$7.5M USD</td>
</tr>
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*Not including option and warrant conversions since 9/30/17 **As of 4/6/18
Investment Highlights

- Multi-Billion $ high-growth market opportunity
- Robust product development pipeline strong IP position
- Able to leverage existing design, manufacturing and sales capabilities
- High-margin Business Model with sustainable cost advantages
- Paradigm Shift Photonic Integrated Circuits – only path to dramatic cost reductions
- Technology developing for mass market commercialization