Lightwave Logic, Inc.
Form 10-K
April 14, 2009

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

[X] **ANNUAL REPORT UNDER SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2008

[ ] **TRANSITION REPORT UNDER SECTION 13 OR 15 (D) OF THE EXCHANGE ACT**

Commission file number: **0-52567**

Lightwave Logic, Inc.

(Exact name of registrant as specified in its charter)

Nevada	**82-049-7368**
(State or other jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)

121 Continental Drive Suite 110 Newark, DE	19713
(Address of principal executive offices)	(Zip Code)

(Registrant s Telephone Number, including Area Code): **302-356-2717**

Securities registered pursuant to Section 12(b) of the Act

Title of each class registered	Name of each exchange on which registered

Securities registered pursuant to section 12(g) of the Act:

Common Stock, Par Value $0.001

(Title of class)

Indicate by check mark if the Registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ¨ No x

Indicate by check mark if the Registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes ¨ No x

Indicate by check mark whether the registrant (1) has filed all reports to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports) and (2) has been subject to such filing requirements for the past 90 days. Yes ý. No ¨.

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of the registrant s knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ý

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See definitions of large accelerated filer, accelerated filer and smaller reporting company in Rule 12b-2 of the Exchange Act. (Check one):

Large Accelerated Filer	¨	Accelerated Filer	¨
Non-Accelerated filer	¨	Smaller reporting company	x

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act of 1934). Yes ¨ No x

On March 26, 2009 there were 37,969,042 shares outstanding of the registrant s common stock, $.001 par value.

Table of Contents

Forward-Looking Statements

This report on Form 10-K contains forward-looking statements. These statements relate to future events or future financial performance and involve known and unknown risks, uncertainties and other factors that may cause our Company or its industry's actual results, levels of activity, performance or achievements to be materially different from any future results, levels of activity, performance or achievements expressed or implied by the forward-looking statements.

In some cases, you can identify forward-looking statements by terminology such as may, will, should, expects, p anticipates, believes, estimates, predicts, potential, or the negative of these terms or other comparable termin These statements are only predictions. Actual events or results may differ materially. Although our Company believes that the expectations reflected in the forward-looking statements are reasonable, our Company cannot guarantee future results, levels of activity, performance or achievements. The forward-looking statements are based on our beliefs, assumptions and expectations of our future performance, taking into account information currently available to us. These beliefs, assumptions and expectations can change as a result of many possible events or factors, including those events and factors described by us in Item 1.A Risk Factors, not all of which are known to us.

Further, this report on Form 10-K contains forward looking statements that involve substantial risks and uncertainties. Such statements include, without limitation, all statements as to expectation or belief and statements as to our future results of operations, the progress of any research and product development, the need for, and timing of, additional capital and capital expenditures, partnering prospects, the protection of and the need for additional intellectual property rights, effects of regulations, the need for additional facilities and potential market opportunities. Our Company's actual results may vary materially from those contained in such forward-looking statements because of risks to which our Company is subject, such as lack of available funding, competition from third parties, intellectual property rights of third parties, regulatory constraints, litigation and other risks to which our Company is subject.

You should not place undue reliance on these forward-looking statements. Statements regarding the following subjects are forward-looking by their nature:

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Our business

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Our business strategy

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Our future operating results

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Our ability to obtain external financing

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Our understanding of our competition

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Industry and market trends

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Future capital expenditures

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The impact of technology on our products, operations and business

PART I

Item 1.

Business.

Our Business Development

PSI-TEC Corporation (**PSI-TEC**) was founded in 1991 and incorporated under the laws of the State of Delaware on September 12, 1995. PSI-TEC was founded in Upland, Pennsylvania by Dr. Frederick J. Goetz where he established a laboratory with a small amount of private funding. PSI-TEC subsequently moved its operations to laboratory space provided by the U.S. Army on the Aberdeen Proving Grounds in cooperation with a division of the Department of Defense for the advancement of ultra wide-bandwidth satellite telecommunications. Thereafter, PSI-TEC commenced operations of its own organic synthesis and thin-films laboratory in Wilmington, Delaware.

In order to become a non-reporting publicly-traded corporation, in July 2004 PSI-TEC reorganized with our Company pursuant to a reorganization agreement between PSI-TEC and all of its shareholders, and our Company's sole officer, director and majority shareholder. Pursuant to the reorganization agreement, (i) our Company changed its name from Eastern Idaho Internet Services, Inc. to PSI-TEC Holdings, Inc.; (ii) our Company acquired all of the issued and outstanding shares of PSI-TEC stock; (iii) PSI-TEC became the wholly-owned operating subsidiary of our Company; and (iv) our Company's then sole officer and director resigned, PSI-TEC's nominees were elected to our Company's board of directors and new management was appointed. For accounting purposes, this acquisition transaction was accounted for as a reverse-acquisition, whereby PSI-TEC was deemed to have purchased our Company. As a result, the historical financial statements of PSI-TEC became the historical financial statements of our Company.

Immediately prior to the time of the reorganization transaction, our Company was a non-reporting development stage company whose stock was traded on the OTC: Pink Sheets and that was seeking other business opportunities; it had no substantive business operations. Our Company was originally incorporated under the laws of the State of Nevada on June 24, 1997 as Eastern Idaho Internet Services, Inc. to operate as an Internet services marketing firm. It was unsuccessful in this venture, and in June 1998 it ceased its operations and sold all of its operating assets.

On October 20, 2006, in order to consolidate the operations of PSI-TEC Holdings, Inc. and PSI-TEC Corp. (PSI-TEC Holdings, Inc.'s wholly owned subsidiary), PSI-TEC Holdings, Inc. and PSI-TEC Corp. merged; and PSI-TEC Holdings, Inc., a Nevada corporation, survived and changed its name to Third-Order Nanotechnologies, Inc. No change of control or domicile occurred as a result of the merger.

On March 10, 2008, Third-order Nanotechnologies, Inc. changed its name to Lightwave Logic, Inc. to better suit its strategic business plan and to facilitate stockholder recognition of the Company and its business.

Unless the context otherwise requires, all references to the **Company**, **we**, **our** or **us** and other similar terms me
Lightwave Logic, Inc., a Nevada corporation.

Our principal executive office is located at 121 Continental Drive, Suite 110, Newark, Delaware 19713 and our telephone number is (302) 356-2717. Our website address is www.lightwavelogic.com. No information found on our website is part of this report. Also, this report includes the names of various government agencies and the trade names of other companies. Unless specifically stated otherwise, the use or display by us of such other parties' names and trade names in this report is not intended to and does not imply a relationship with, or endorsement or sponsorship of us by, any of these other parties.

Overview

We are a development stage research and development company. We have developed and are continuing to develop high-activity, high-stability electro-optic polymers which we believe could have a broad range of applications in the electro-optic device market.

Electro-optic devices convert data from electric signals into optical signals for use in communications systems and in optical interconnects for high-speed data transfer. We expect our patented and patent-pending technologies when completed and tested to be utilized by electro-optic device manufacturers, such as telecommunications component and systems manufacturers, networking and switching suppliers, semiconductor companies, aerospace companies and government agencies.

Our electro-optic polymers (plastics) are property-engineered at the molecular level (nanotechnology level) to meet the exacting thermal, environment and performance specifications demanded by electro-optic devices. We believe that our patent pending technologies will enable us to design electro-optic polymers that are free from the numerous diverse inherent flaws that plague competitive polymer technologies employed by other companies and research groups. We engineer our polymers with the intent to have temporal, thermal, chemical and photochemical stability within our patent pending molecular architectures.

Our patent pending molecular architectures are based on a well-understood chemical and quantum mechanical occurrence known as aromaticity. Aromaticity provides a high degree of molecular stability. Aromaticity is what will enable our core molecular structures to maintain stability under a broad range of polymerization conditions that otherwise appear to affect other current polymer molecular designs. Polymers, polymer-based devices and the processes used to create them are often patentable, which can provide the developers of such technology with a significant competitive advantage. We consider our proprietary intellectual property to be unique.

Glossary of Select Technology Terms Used Herein

All-optical devices. All-optical devices convert data in the form of input light signals to a secondary light data stream. The future market of all-optic devices is expected to include all-optical transistors.

All-optical transistors. All-optical transistors are devices currently underdevelopment that use an input light signal to switch a secondary light signal. All-optical transistors are expected to enable the fabrication of an entirely new high-speed generation of computers

that operate on light instead of electricity, which in turn should significantly improve computation speeds.

Aromaticity. Aromaticity causes an extremely high degree of molecular stability. It is a molecular arrangement wherein atoms combine into a ring or rings and share their electrons among each other. Aromatic compounds are extremely stable because the electronic charge distributes evenly over a great area preventing hostile moieties, such as oxygen and free radicals, from finding an opening to attack.

CLD-1. An electro-optic material based upon unstable polyene molecular architectures. Unlike our own molecular designs, CLD-1 is not a CSC model molecule and exhibits thermal degradation at low temperatures (~250 C) which makes it less suitable for commercial and military applications.

CSC (Cyclical Surface Conduction) theory. Most charge-transfer dyes (e.g. Disperse Red 1, CLD, FTC) are based upon a polyene architecture wherein the ground state and first excited state differ by the alteration of single and double bonds. CSC model molecules use nitrogenous heterocyclical structures.

Electro-optic devices. Electro-optic devices convert data from electric signals into optical signals for use in communications systems and in optical interconnects for high-speed data transfer.

Electro-optic materials. Electro-optic materials are materials that are engineered at the molecular level. Molecular level engineering is commonly referred to as nanotechnology.

Electro-optic modulators. Electro-optic modulators are electro-optic devices that perform electric-to-optic conversions within the infrastructure of the Internet.

Nanotechnology. Nanotechnology refers to the development of products and production processes at the molecular level, which is a scale smaller than 100 nanometers (a nanometer is one-billionth of a meter).

Nitrogenous heterocyclical structure. A multi-atom molecular ring or combination of rings that contain nitrogen.

Plastics/Polymers. Polymers, also known as plastics, are large carbon-based molecules that bond many small molecules together to form a long chain. Polymer materials can be engineered and optimized using nanotechnology to create a system in which unique surface, electrical, chemical and electro-optic characteristics can be controlled. Materials based on polymers are used in a multitude of industrial and consumer products, from automotive parts to

home appliances and furniture, as well as scientific and medical equipment.

Polymerization. Polymerization is a molecular engineering process that provides the environmental and thermal stability necessary for functional electro-optical devices. Polymer materials can be engineered and optimized using nanotechnology to create a system in which unique surface, electrical, chemical and electro-optic characteristics can be controlled.

Thermal Gravimetric Analysis (TGA). The basic principle in TGA is to measure the mass of a sample as a function of temperature. This, in principle, simple measurement is an important and powerful tool in solid state chemistry and materials science. The method for example can be used to determine water of crystallisation, follow degradation of materials, determine reaction kinetics, study oxidation and reduction, or to teach the principles of stoichiometry, formulae and analysis.

Zwitterionic-aromatic push-pull. Most charge-transfer dyes (e.g. Disperse Red 1, CLD, FTC) have an excited state (such as during photonic absorption) wherein a full charge is separated across the molecule. Such a molecule is said to be excited-state zwitterionic. Within such a molecular system the zwitterionic state is unstable and the molecule typically collapses rapidly into its lower dipole ground state. In our molecular designs, the excited state is further stabilized by the aromatization of the molecular core. In that aromaticity stabilizes this excited state, it is said to "pull" the molecule into this higher energy state; on the other hand, the unstable zwitterionic state is said to "push" the molecule out of the excited state.

Our Business

Lightwave Logic, Inc., is developing a new generation of advanced electro-optic plastics that convert high-speed electronic signals into optical (light) signals. Electro-optic material is the core active ingredient in high-speed fiber-optic telecommunication systems. Utilizing our proprietary technology, we are in the process of engineering advanced electro-optic plastics which we believe may lead to significant performance advancements, component size and cost reduction, ease of processing, and thermal and temporal stability. We believe that polymer materials engineered at the molecular level may have a significant role in the future development of commercially significant electro-optic related products.

In order to transmit digital information over long or intermediate distances at extremely high-speeds (wide bandwidth), electrical signals, such as those produced by a computer or telephone, must be converted into optical signals for transmission over long-distance fiber-optic cable. Within the infrastructure of the Internet, a device known as an electro-optic modulator performs the electric-to-optic conversion. Within the electro-optic modulator, an electro-optic material performs the actual conversion of electricity to an optical signal. These materials change their optical properties in the presence of an electric field at extremely high frequencies (wide bandwidths).

Currently, the core electro-optic material contained in most modulators is a crystalline material, such as lithium niobate or gallium arsenide, which must be manufactured in strict dust-free conditions since even slight contamination can render them inoperable. As a result, these crystalline materials are expensive to produce. Current electro-optic crystals are limited to telecommunication speeds that are less than 40Gb/s (40 billion digital bits of data per second). Lithium niobate devices require large power levels (modulation voltages) to operate and are large in size -- typically measuring about four inches long. Considering that most integrated circuits are literally invisible to the naked eye, these devices are enormous. Additionally, it is important to note that these crystalline-based electro-optic modulators require expensive mechanical packaging (housings) generally comprised of materials, such as gold-plated Kovar, in

order to assure

operational integrity over required time and operating temperature ranges.

Unlike crystals, electro-optic plastics appear to be capable of being tailored at the molecular level for optimal performance characteristics. Additionally, electro-optic plastics are less expensive to manufacture and demand significantly lower power requirements (modulation voltages). The electro-optic plastics have demonstrated the ability to perform many times faster (>100Gb/s) than existing crystalline technology.

We consider electro-optic plastics to be the most feasible technology for future high-speed (wide bandwidth) electronic-optical conversion. Due to the ease of processing afforded by electro-optic plastics, as well as their capacity to foster component size reduction, we believe electro-optic plastics have the potential to replace existing high-speed fiber-optics components that are used today in many commercial and military applications.

We also believe that the extreme miniaturization provided by advanced electro-optic plastics may allow for the successful fabrication of chip-to-chip (backplane) optical interconnect devices for computers that create the high-speed data transmission necessary for extremely high-speed computations. Further, we believe that additional potential applications for electro-optic plastics may include phased array radar, cable television (CATV), electronic counter measure (ECM) systems, ultra-fast analog-to-digital conversion, land mine detection, radio frequency photonics, spatial light modulation and all-optical (light-switching-light) signal processing.

Our Electro-Optic Technology

For the past two decades, diverse corporate interests, including, to our knowledge, IBM, Lockheed Martin, DuPont, AT&T Bell Labs, Corning, Honeywell and 3M, as well as numerous universities and U.S. Government Agencies, have been attempting to produce high-performance, high-stability electro-optic plastics for high-speed (wide bandwidth) telecommunication applications. These efforts have largely been unsuccessful due, in our opinion, to the industry's singular adherence to an industry pervasive engineering model known as the Bond Length Alternation ("BLA") theory model. The BLA model, like all other current industry-standard molecular designs, consists of molecular designs containing long strings of atoms called polyene chains. Longer polyene chains provide higher electro-optic performance, but are also more susceptible to environmental threats, which result in unacceptably low-performing, thermally unstable electro-optic plastics.

As a result, high frequency modulators engineered with electro-optic plastics designed on the BLA model or any other polyene chain design model are unstable over typical operating temperature ranges, and often exhibit performance degradation within days, hours or even minutes. Similarly, lower frequency modulators exhibit comparable failings, but to a lesser extent. These flaws have prevented commercial quality polymer-based modulators operating at 10-40Gb/s from entering the commercial marketplace. The thermal stability of these devices does not generally meet the minimum Telcordia GR-468 operating temperature range (-40 degrees Celsius to +85 degrees Celsius) much less the more harsh MILSPEC 883D (military specification) range of -55 degrees Celsius to 150 degrees Celsius.

7

None of our molecular designs rely on the BLA polyene chain design model. Our proposed solution lies in a far less mainstream, yet firmly established, scientific phenomenon called aromaticity. Aromaticity causes a high degree of molecular stability. It is a molecular arrangement wherein atoms combine into multi-membered rings and share their electrons among each other. Aromatic compounds are stable because the electronic charge distributes evenly over a great area preventing hostile moieties, such as oxygen and free radicals, from finding an opening to attack. To our knowledge, no one has previously been able to demonstrate molecular designs that could effectively exploit aromaticity in the design of a high-performance electro-optic plastic.

Our research and findings in this area resulted in our Company being the sole recipient of the 2006 Electro-Optic Materials Technology Innovation of the Year Award by Frost & Sullivan. Frost & Sullivan's Technology Innovation of the Year Award is bestowed upon candidates whose original research has resulted in innovations that have, or are expected to bring, significant contributions to multiple industries in terms of adoption, change, and competitive posture. This award recognizes the quality and depth of our Company's research and development program as well as the vision and risk-taking that enabled us to undertake such an endeavor. Our Company did not actively elicit consideration or apply to receive this award. Frost & Sullivan independently contacted our Company and conducted several interviews which included chemical and technical experts in the field of electro-optics who were supplied with detailed public information regarding our Company's technological innovations.

Our Patents

We hold one patent and thirty pending patent applications (consisting of five patent applications in each of Australia, Canada, China, European Patent Convention, Japan and the U.S. based on the PCT applications below) in the field of nonlinear optic chromophore design as follows:

6,041,157

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Environmentally sensitive compositions of matter based on 3H-fluoren-3- ylidenes and process for making same;

PCT/US05/39212

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Tricyclic Spacer Systems for Nonlinear Optical Devices;

PCT/US05/39664

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Anti-Aromatic Chromophore Architectures;

PCT/US05/39213

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Heterocyclical Anti-Aromatic Chromophore Architectures;

PCT/US05/39010

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Heterocyclical Chromophore Architectures;

PCT/US06/11637

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Heterocyclical Chromophore Architectures with Novel Electronic Acceptor Systems.

Heterocyclical Anti-Aromatic Systems. Two of our provisional patents cover heterocyclical anti-aromatic electronic conductive pathways, which are the heart of our high-performance, high-stability molecular designs. The completely heterocyclical nature of our molecular designs "lock" conductive atomic orbitals into a planar (flat) configuration, which provides improved electronic conduction and a significantly lower reaction to environmental threats (e.g. thermal, chemical, photochemical, etc.) than the BLA design paradigm employed by other competitive electro-optic polymers.

The anti-aromatic nature of these structures dramatically improves the "zwitterionic-aromatic push-pull" of the systems, providing for low energy charge transfer. Low energy charge transfer is important for the production of extremely high electro-optic character.

Heterocyclical Steric Hindering System. This patent describes a nitrogenous heterocyclical structure for the integration of steric hindering groups that are necessary for the nanoscale material integration. Due to the [pi]-orbital configuration of the nitrogen bridge, this structure has been demonstrated not to interfere with the conductive nature of the electronic conductive pathway and thus is non-disruptive to the electro-optic character of the core molecular construction. The quantum mechanical design of the system is designed to establish complete molecular planarity (flatness) for optimal performance.

Totally Integrated Material Engineering System. This patent covers material integration structures under a design strategy known as Totally Integrated Material Engineering. These integration structures provide for the "wrapping" of the core molecule in sterically hindering groups that maximally protect the molecule from environmental threats and maximally protect it from microscopic aggregation (which is a major cause of performance degradation and optical loss) within a minimal molecular volume. These structures also provide for the integration of polymerizable groups for integration of materials into a highly stable cross-linked material matrix.

Our Latest Tests and Results

Prior to our recent experimental results, in 2004, quantum mechanical calculations were independently performed on our novel electro-optic plastic designs at government laboratories located at the Naval Air Warfare Center Weapons Division in China Lake, California. The results of these calculations suggest that our initial aromatic molecules perform two and a half (2.5) to three and three-tenths (3.3) times more efficiently than currently available telecom grade electro-optic plastics. Logical extensions of this novel molecular design paradigm further suggest even greater performance improvements. Subsequently, top scientists and engineers at Wright-Patterson Air Force Base reviewed these calculations and concluded that our molecular designs show promise of a five to ten times improvement over existing commercial polymeric architectures. Our conclusion is that performance improvements of this magnitude indicate a significant breakthrough in the field of fiber-optic telecommunication.

In May and June of 2006, we initiated performance evaluations of one of our first extremely high-performance electro-optic materials. The initial tests were performed by electro-optic expert, Dr. C.C. Teng, co-inventor of the

renowned Teng-Man test, the industry-wide standard method of evaluating the material performance of electro-optic plastics, and subsequently confirmed by the University of Arizona's College of Optical

Sciences, one of the most respected and fastest growing optical sciences departments in the world. Under identical laboratory conditions at low molecular loadings, one of our recent molecular designs outperformed one of the industry's highest performance electro-optic systems by a factor as high as 650%.

We believe results of the Teng-Man test have established the validity of our novel, patent pending molecular design paradigm known as CSC (Cyclical Surface Conduction) theory. We believe the success of CSC theory has the potential to establish the fundamental blueprint of electro-optic material design for decades to come, and to have broad application in commercial and military telecommunication and advanced computational systems.

On September 25, 2006 we obtained independent laboratory results that confirmed the thermal stability of our Perkinamine electro-optic materials. Thermal stability as high as 350 degrees Celsius was confirmed, significantly exceeding many other commercially available high performance electro-optic materials, such as CLD-1 which exhibits thermal degradation in the range of 250 degrees Celsius to 275 degrees Celsius. This high temperature stability of our materials eliminates a major obstacle to vertical integration of electro-optic polymers into standard microelectronic manufacturing processes (e.g. wave/vapor-phase soldering) where thermal stability of at least 300 degrees Celsius is required. In independent laboratory tests, ten-percent material degradation, a common evaluation of overall thermal stability, did not occur until our Perkinamine material base was exposed to temperatures as high as 350 degrees Celsius, as determined by Thermo-Gravimetric Analysis (TGA).

The test results supported our Company's progress to introduce our materials into commercial applications such as optical interconnections, high-speed telecom and datacom modulators, and military/aerospace components.

In July 2007, our Company developed an innovative process to integrate our unique architecture into our anticipated commercial devices, whereby dendritic spacer systems are attached to its core chromophore. In the event we are successful in developing a commercially viable product, we believe these dendrimers will reduce the cost of manufacturing materials and reduce the cost and complexity of tailoring the material to specific customer requirements.

In March 2008, we commenced production of our first prototype photonic chip, which we delivered to Photon-X, LLC to fabricate a prototype polymer optical modulator and measure its technical properties. As a result of delays caused by engineering setbacks related to our material production, the production of our first prototype photonic chip was temporarily halted, along with the completion of our proof of concept tests that were being administered by Dr. Robert Norwood at the University of Arizona Photonics Department. In order to address this issue, Dr. David Eaton s role and responsibilities with the Company were significantly expanded, and we added two veteran synthetic chemists to our science and technology team. We now believe we have overcome these engineering setbacks and we believe we are prepared to start our next phase of testing for material performance (r33) Teng-Man testing protocol in order to re-confirm previous test results. Once again, we intend to deliver independent validated r33 test results necessary for secondary proof of concept testing, as we have in the past. We may incur delays in this process due to slower than expected material production within our laboratories

10

and/or delays caused by the testing procedures. Should these tests produce a functional 40Gb/s or greater modulator we expect to go forward with product development and marketing in the telecommunication market with partners in the telecommunication field. We cannot anticipate the details of the customer adoption cycle until we have produced a functional prototype to create a credible technology offering.

The Electro-Optic Device Market

General

Electro-optic devices such as fiber-optic modulators translate electric signals into optical signals. Such devices are used in communication systems to transfer data over fiber-optic networks. Optical data transfer is significantly faster and more efficient than transfer technologies using only electric signals, permitting more cost-effective use of bandwidth for broadband Internet and voice services.

Two distinct technologies currently exist for the fabrication of fiber-optic devices, such as fiber-optic modulators. The first, which is the more traditional technology, utilizes an electro-optically active inorganic core crystalline material (e.g. lithium niobate). The second, which is the up-and-coming technology, involves the exploitation of electro-optic plastics.

Traditional Technology - Inorganic Crystals

Traditional technology translates electric signals into optical signals generally relying upon electro-optic materials, such as lithium niobate or gallium arsenide. Six of the largest inorganic fiber-optic component manufactures hold approximately 85% of the electro-optic modulator component market. They are JDS Uniphase, Sumitomo, Avanex, Covega, Fujitsu, and Bookham. These companies are heavily invested in the production of crystalline-based electro-optic modulator technologies, as well as the development of novel manufacturing techniques and integrated laser/modulator designs. While each company possesses their own modulator design and processing patents, the underlying core constituents (lithium niobate, gallium arsenide, indium phosphide) occur in nature and as such cannot be patented.

New Technology - Organic Plastics

Our developing technology that translates electric signals into optical signals relies upon organic electro-optic materials, such as electro-optic plastics. Electro-optic plastics involve the material integration of specifically engineered organic (carbon-based) compounds. The molecular designs of these compounds are precise and do not

occur naturally; thus they may be protected under patent law.

Plastic-based electro-optic modulators may provide considerable advantages over traditional inorganic fiber-optic technology in terms of:

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Costs.

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Size and versatility.

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Modulating/switching speed.

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Optical transmission properties.

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Lower operating voltages.

Other than our own Company, we are aware of only one other company, Gigoptix, Inc. who reorganized with Lumera Corporation ("Lumera") in December 2008, which has designed and patented potentially commercially feasible electro-optic plastics. Prior to our own technological developments, Lumera held an exclusive monopoly on this area of technology because Lumera holds an exclusive present and future license to all electro-optic polymeric technology developed within the University of Washington. Lumera has yet, to our knowledge, to publicly demonstrate a robust, stable commercial modulator capable of low cost volume production.

As a result, no significant commercial market developments have occurred with electro-optic plastic devices. This is because all previously known electro-optic polymer design strategies incorporate molecular structures that adversely react to the requisite polymerization processes that thermally-stabilize the material matrix. This inherent design flaw causes the polymer to melt at unreasonably low temperatures, which corrupts the polymer's electro-optic performance.

Our Company holds an extensive amount of internally developed intellectual property in the field of electro-optic molecular design that, as a whole, attempts to fundamentally solve these and other problems associated with these molecular structures. We believe our provisional patents describe broad, highly unique techniques for novel paradigms in molecular design.

Our innovative solution lies in a very well-known scientific phenomenon called aromaticity, which causes a high degree of molecular stability. Aromaticity is a molecular arrangement wherein atoms combine into multi-membered rings and share their electrons among each other. Aromatic compounds are extremely stable because the electronic charge distributes evenly over a great area preventing hostile moieties, such as oxygen and free radicals, from finding an opening to attack. Until now, to our knowledge, no one has been able to propose molecular designs that could effectively exploit aromaticity in the design of a high-performance electro-optic plastic.

We believe now that we have fabricated electro-optic molecular architectures that do in fact exhibit extremely high thermal stability, our technologies may soon replace inorganic electro-optic materials in the marketplace due to their considerable advantages over traditional inorganic fiber-optic materials.

Our Target Markets

Our proprietary electro-optic plastics are designed at the molecular level for potentially superior performance, stability and cost-efficiency and we believe may have the potential to replace more expensive, lower-performance materials used in fiber-optic ground, wireless and satellite communication networks. We believe our electro-optic plastics may have broad applications in civilian and military telecommunications and advanced computational systems. Potential future applications may include: (i)

telecommunications; (ii) backplane optical interconnects; (iii) entertainment; (iv) medical applications; (iv) satellite reconnaissance; (vi) navigational systems; (vii) radar applications; and (viii) all-optical transistors.

Telecommunications

Telecommunications is the primary initial target application for electro-optic plastics. Electro-optic plastics could not only simplify the device design of key components, such as modulators, significantly reducing packaging costs, but could also provide for higher speed devices with greater system miniaturization. Current crystalline (e.g. lithium niobate) fiber-optic modulators are difficult and expensive to manufacture due to the complexities of producing single crystalline ingots of sufficient diameter (3 to 5 inches). Also, strict environmental controls must be enforced during the growth of the core crystalline material. Plastics are not inherently costly to produce nor do they require such strict environmental conditions. Due to their material flexibility (e.g. ability to more easily mold into specific topologies) they are expected to enable smaller, cheaper, faster, less expensive, and more integrated network components. In many laboratory tests, electro-optic polymers have demonstrated substantial (3-10x) transmission data speed improvements over crystalline technologies (lithium niobate, gallium arsenide, indium phosphide).

Backplane Optical Interconnects

It is reported that backplane optical interconnects are envisioned by members within leading corporations (including IBM, Intel and Agilent Technologies) as the future of high-speed computation. These components could speed the transmission of information within an integrated circuit, among integrated circuit chips in a module, and across circuit boards at speeds unattainable with traditional metallic interconnections and bus structures. In the future, all-optical (light switching light) signal processing could become possible using an advanced version of our chemistry.

Entertainment

Entertainment applications, including CATV and Internet, are a highly important potential application subdivision of the telecommunication market. The ever-increasing number of entertainment services such as VOD (video on demand) and digital cable, as well as the future ability to download television and movies real-time from the Internet, drives the demand for ever-increasing bandwidth. Flexible displays utilizing organic light emitting diodes are inherently compatible with our polymer waveguides.

Medical Applications

Medical Applications for electro-optic plastics have been proposed for many varied applications, including dentistry, oncology and protein identification. Although experimental, it is believed that the successful fabrication of high-stability electro-optic plastics could open up many future applications such as these. Other medical applications

such as the higher-speed transmission of medical records, X-ray and MRI scans over the Internet would be improved by the broadening of Internet bandwidths.

Satellite Reconnaissance

Satellite reconnaissance applications include a specific target market within the Department of Defense, the 14-member Intelligence Community and their contractors. Electro-optic plastics have historically been seen as attractive for potential application in this market due to the constant need for the fastest bandwidth transmission to meet the needs of national security.

Navigational Systems

Navigational systems for both advanced aerial and missile guidance require the use of electro-optic gyroscopes. These devices are currently fabricated out of lithium niobate or similar electro-optic materials; the application of electro-optic plastics would facilitate the development of more accurate and architecturally simple device designs.

Radar Applications

Radar Applications, specifically phased array radar, has been traditionally understood as a potential application for successful electro-optic material designs, along with electronic counter measure systems (ECM) systems, ultra-fast analog-to-digital conversion, land mine detection, radio frequency photonics and spatial light modulation.

All-Optical Transistors

All-optical transistors are expected to be included in the future market of all-optic devices. All-optical devices convert data in the form of input light signals to a secondary light data stream. Some experts anticipate that all-optical transistors will replace traditional transistors used today in microprocessors. All-optical transistors are expected to enable the fabrication of an entirely new high-speed generation of "plastic" computers that operate on light instead of electricity, which in turn should significantly improve computation speeds.

Our Business Strategy

Our economic model anticipates that our revenue stream will be derived from one or some combination of the following: (i) technology licensing for specific product application; (ii) joint venture relationships with significant industry leaders; or (iii) the production and direct sale of our own electro-optic device components. Our objective is to be a leading provider of proprietary technology and know-how in the electro-optic device market. In order to meet this

objective, we intend, subject to successful testing of our technology and having available financial resources, to:

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Develop electro-optic product devices.

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Continue to develop proprietary intellectual property.

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Streamline our product development process.

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Develop a comprehensive marketing plan.

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Maintain/develop strategic relationships with government agencies, private firms, and academic institutions.

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Attract seasoned executives and science and technology personnel to our Company.

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Expand into a state-of-the-art development, testing and manufacturing facility.

Develop Electro-Optic Product Devices

We intend to utilize our proprietary technology to create an initial portfolio of commercially feasible electro-optic plastic product devices and applications for various markets, including telecommunications and government. We expect our initial product device line to include high speed 40Gb/s and 100Gb/s modulators and system applications.

Continue to Develop Proprietary Intellectual Property

We plan to advance our core competence in electro-optic plastic technology by continuing to develop proprietary materials, processes, designs and devices. We also plan to protect our technology by filing patent applications where appropriate, obtaining exclusive technology rights where available, and taking other appropriate steps to secure and protect our intellectual property.

Streamline Our Product Development Process

We intend to streamline our development process and to design, fabricate and test proprietary materials and potential electro-optic plastic devices in order to position our Company to take advantage of emerging market opportunities.

Develop a Comprehensive Marketing Plan

We intend to build a sales and marketing organization dedicated to developing customers and multiple distribution channels for our products. We plan to aggressively pursue sales of our potential products through the use of industry-specific sales organizations, such as electro-optic component representatives and distributors. In addition, we plan to target market leaders as initial customers and to leverage relationships with these market leaders to obtain future contracts and sales references.

In 2008 we retained TangibleFuture, Inc., a San Francisco based technology analysis and business development consulting company, to generate an independent assessment of our business opportunities in the fiber-optic telecommunications and optical computing sectors and develop strategies to penetrate those potential markets.

Maintain/Develop Strategic Relationships with Government Agencies, Private Firms, and Academic Institutions

Almost since our inception, we have had beneficial strategic relationships with various government agencies that have provided us with funding and access to important technology. We intend to re-establish our relationship with DARPA, the Defense Advance Research Project Agency (the agency in the Intelligence Community credited with the origination of the Internet), by sharing the technical data and test results on our aromatic molecular materials. DARPA previously provided our Company with funding in order to advance of our technologies and to bring them to the public market, but due to a change in focus at DARPA our funding was not renewed.

As we advanced towards the commercialization phase of our strategic plan, we commenced discussions with several potential strategic alliance partners ranging from micro-electronic component firms to large-scale computer companies, as well as petrochemical companies having very large volume production capabilities. We believe strategic alliances and/or technology licensing will be a crucial step in commercializing our novel technologies and achieving competitive advantages. We entered into a strategic relationship with Photon-X, LLC, a technology solutions provider for polymer waveguides that works in conjunction with various government agencies.

We have also developed an excellent relationship with the University of Delaware, an institution well known for excellence in chemical engineering, which we intend to maintain and strengthen.

Attract seasoned executives and science and technology personnel to our Company

In May 2007, we retained Dr. David F. Eaton as our Interim Chief Technology Officer and in January 2008, Dr. Eaton became our permanent Chief Technology Officer. Previously, Dr. Eaton spent thirty years with DuPont where he worked in research & development, research & development management and business leadership positions. Dr. Eaton spearheaded DuPont s entry into polymer-based components for fiber optic telecommunication by founding DuPont Photonics Technology, a wholly owned subsidiary of DuPont.

In March 2008, we retained Terry Turpin as our Optical Computing Guru. Mr. Turpin began his engineering career developing computing engines for the National Security Agency (NSA) where he served as Chief of the Advanced Processing Technologies Division, representing the NSA on the Tri-Service Optical Processing Committee organized by the Under Secretary of Defense for Research and Engineering.

In August 2008, we retained Mr. James S. Marcelli as our Chief Executive Officer. Mr. Marcelli has served as the president and/or chief executive officer of multiple start-up and growth companies in high tech development and manufacturing businesses with a core focus on business and market development and building strong management teams.

In November 2008, we retained Howard E. Simmons, III, PhD to our technology team. Dr. Simmons is a graduate of MIT and Harvard, who spent 25 years with DuPont engaged in research & development at the corporate and business unit level. Mr. Simmons has contributed to programs in organic light emitting diodes (OLEDS), printable electronics, graphic arts, optical recording materials and fundamental polymer research and holds 26 patents.

In February 2009, we retained Anthony J. Cocuzza, PhD to our technology team. Dr. Cocuzza worked for 30 years in medicinal chemistry and brings a highly developed set of synthetic and analytical skills to our Company. A graduate

of Princeton, Dr. Cocuzza spent 24 years with DuPont engaged in corporate research & development and with DuPont s joint venture with Merck.

Expand Into A State-Of-The-Art Development, Testing and Manufacturing Facility

We plan to expand into a state-of-the-art development, testing and manufacturing facility in order to advance our technology platforms, attract additional key industry talent, streamline our product development processes and minimize our time to market. We have already begun to integrate our operations with respect to streamlining our product development process and minimizing the time to market for our potential products through a multifaceted approach to material development. We are able to accomplish this because our technology provides us with the flexibility to create tailored material properties for a multitude of specific applications, and also to allow for the specific tailoring of materials for compatibility with silicon, glass, metals or many plastics.

In August 2006, we executed a co-location agreement with a New Jersey-based micro-optics company, InPlane Photonics that allowed our scientists to advance our organic material development. The agreement with InPlane was terminated in early 2007 in favor of a strategic alliance formed in December, 2006 with Photon-X, LLC, a Pennsylvania-based company that has significant experience in polymer waveguide production. Photon-X is working as a strategic ally with our Company to establish a pre-production line in order to test and integrate our organic materials into waveguide devices and system prototypes as a first step toward product commercialization. The agreement affords our Company access to a full suite of fabrication facilities capable of producing commercial quantities of precision micro-optic devices such as high-speed 40Gb/s telecom modulators, optical filters, and optical interconnects important to military and civilian global information movement and management markets.

Our Research and Development Process

Our research and development process consists of the following steps:

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We develop novel polymer materials utilizing our patent pending technology to meet certain performance specifications. We then develop methods to synthesize larger quantities of such material.

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We conduct a full battery of tests at the completion of the synthesis of each new polymer material to evaluate its characteristics. We also create development strategies to optimize materials to meet specifications for specific applications.

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We integrate data from the material characterization and test results to fabricate devices. We analyze device-testing results to refine and improve fabrication processes and methods. In addition, we investigate alternative material and design variations to possibly create more efficient fabrication processes.

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We create an initial device design using simulation software. Following device fabrication, we run a series of optical and electronic tests on the device.

Our Current Strategic Partners

Photon-X, LCC

We entered into a strategic relationship with Photon-X, LLC, a technology solutions provider for polymer waveguides that works in conjunction with various government agencies. In connection therewith, we will provide Photon-X with our unique polymeric material to be tested and used on certain niche devices for anticipated military and commercial applications. If the tests are successful, our management believes that our alliance with Photon-X will serve to simultaneously lead its commercialization as well as publicly validate its scientific findings, creating a new standard in electro-optic polymers.

TangibleFuture, Inc.

In 2008 we retained TangibleFuture, Inc., a San Francisco based technology analysis and business development consulting company, to generate an independent assessment of our business opportunities in the fiber-optic telecommunications and optical computing sectors. TangibleFuture, Inc. has substantial expertise in photonics and fiber optic telecommunications; and their team has experience in running and developing photonics related companies.

Our Past Government Program Participation

Our Company has been a participant in several vital government sponsored research and development programs with various government agencies that protect the interests of our country. The following is a list of some of the various divisions of government agencies that have provided us with advisory, financial and/or materials support in the pursuit of high-speed electro-optic materials. We are not partnered with, strategically related to, or financially supported by any governmental agency at this time.

National Reconnaissance Office (NRO)

During 1998 and 1999, we worked with the NRO to advance the development of extremely high performance electro-optic polymers pursuant to an unclassified Director's Innovative Initiative. The NRO is a member of the Department of Defense Agency and plays a primary role in achieving information superiority for the U.S. Government and Armed Forces. The NRO designs, builds, and operates reconnaissance satellites, assists in military operation preparedness, and monitors the environment. NRO products are paramount to national security and are provided to an expanding list of users including the Central Intelligence Agency and the Department of Defense.

Army Research Laboratory (ARL)

During 1998 through 2000, we were provided strong support for our electro-optic materials development by the Process and Properties Branch of the Army Research Laboratory on the Aberdeen Proving Grounds in Aberdeen, Maryland. This support was in cooperation with other government agencies and included the advisory support of the Army Missile Command at Redstone Arsenal. The Army Research Laboratory provided us with access to its highly advanced organic chemical development laboratories and state-of-the-art analytic equipment. PSI- TEC operated out of more than five laboratories at the Army Research Laboratory. During the nascent stages of our technological development, this support provided us with the strong foundations we needed to progress electro-optic technology into its second generation. The technically skilled members at Army Missile Command provided our engineers instruction on the latest advancements of the military's research and development in the area of polymeric materials and device fabrication. Much of our initial work at the Army Research Laboratory was based upon revolutionary advancements of our Chief Technical Officer's (Dr. Frederick J. Goetz) highly unique electro-optic polymeric design as exhibited in our U.S. Patent #6,041,157: "Environmentally sensitive compositions of matter based on 3H-fluoren-3-ylidenes and process for making same."

Defense Advance Research Project Agency (DARPA)

DARPA, the agency in the Intelligence Community credited with the origination of the Internet, provided our Company with funding for the advancement of our technologies and bridging these technologies to the public market. Under the auspices of DARPA initiatives, the MORPH (Molecular Photonics) and C2OI (Chip-to-Chip Optical Interconnects) programs, our advanced technologies were reviewed by the Naval Air Warfare Center Weapons Division (NAVAIR) and the Air Force Research Laboratory (AFRL). DARPA works to maintain the technological superiority of the U.S. military and to prevent technological surprise from harming our national security by sponsoring revolutionary, high-payoff research that bridges the gap between fundamental discoveries and their military use.

Naval Air Warfare Center Weapons Division (NAVAIR)

Under the auspices of the Defense Advance Research Projects Agency (DARPA), high-level scientists at the Naval Air Warfare Center Weapons Division in China Lake, California reviewed our electro-optic molecular design paradigms in 2004. Computer calculations regarding the quantum mechanical performance of our electro-optic molecular designs were repeated and verified by NAVAIR staff. These calculations suggest an improvement in electro-optic performance over the current state-of-the-art.

Our unique, proprietary technology was demonstrated through detailed computer calculations to improve existing approaches in the production of ultra fast frequencies (wide bandwidths). Calculations performed at NAVAIR regarding our preliminary, first-stage next-generation molecular architectures indicate an improvement of hyperpolarizability (electro-optic character) of several times existing state-of-the-art molecular designs.

These computer calculations have been validated by independent tests performed on our recently developed electro-optic materials at the University of Arizona.

Air Force Research laboratory (AFRL)

In cooperation with the Defense Advance Research Projects Agency (DARPA), our molecular design technologies were reviewed by top-level and senior engineers and scientists at the Air Force Research Laboratory at Wright-Patterson Air Force Base in Dayton, Ohio. An Air Force Research Laboratory senior scientist and engineer, in connection with a National Science Foundation proposal and as a result of reviews conducted under the Defense Advance Research Projects Agency's C2OI (Chip-to-Chip Optical Interconnects) and MORPH (Molecular Photonics), concluded that, "[our] molecular designs show promise of a five to ten times improvement over existing commercial polymeric architectures." In review of detailed calculations performed on our future material designs, Air Force Research Laboratory personnel further note, "Computer simulations and modeling indicate that [our] approach to materials synthesis has the potential for realizing high nonlinearity (i.e., high electro-optic performance). This, in turn, could result in five to ten times lower drive voltages for devices." "Synthesis of [our] materials to verify the properties predicted by the computer models is essential for new NLO (electro-optic) polymer material development.... This is a very novel and promising approach that has the potential for high payoff."

These predictions were validated in 2006 by independent tests performed on our patent pending electro-optic materials at the University of Arizona, which performed approximately seven times better than other competitive technologies.

In regards to applications of our materials, an Air Force Research Laboratory senior scientist states, "Highly active NLO (electro-optic) polymer materials are key for the realization of next generation electro-optic devices and render high application potential for high-speed fiber-optic telecommunication (i.e., Internet, HDTV), satellite

reconnaissance (i.e., homeland security), and navigation and guidance systems."

Our Competition

The markets we are targeting for our electro-optic polymer technology are intensely competitive. Among the largest fiber-optic component manufactures are JDS Uniphase, Avanex, Sumitomo, Fujitsu, Mitsubishi, Corning, Bookham, OpNext and FiBest. Additional significant domestic component manufacturers include Covega, Apogee, Multiplex, and CyOptics. All of these companies are heavily invested in the production of crystalline-based electro-optic modulator technologies as well as the development of novel manufacturing techniques and modulator designs.

Other than our own Company, we are aware of only one other company, Gigoptix, Inc. who reorganized with Lumera Corporation ("Lumera") in December 2008, which has designed and patented potentially commercially feasible electro-optic plastics. Prior to our own technological developments, Lumera held an exclusive monopoly on this area of technology because Lumera holds an exclusive present and future license to all electro-optic polymeric technology developed within the University of Washington. Lumera has yet, to our knowledge, to publicly demonstrate a robust, stable commercial modulator capable of low cost volume production.

As one of only two companies known to us that are actively pursuing the development of high-performance electro-optic materials for application and development in the high-speed telecommunication markets, we believe that upon the commercialization of our technology, that we will be poised to obtain a significant portion of the component manufacturing market. Electro-optic plastics demonstrate several advantages over other technologies, such as crystalline-based technologies, due to their reduced manufacturing and processing costs, higher performance and lower power requirements. Our electro-optic plastics are CSC model molecules that have demonstrated significant stability advantages over our sole known competitor's materials. In the expectation of becoming the sole producer of high-performance, high-stability electro-optic materials, we hope to capture all or some of this potential electro-optic component market.

We believe the principal competitive factors in our target markets are:

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The ability to develop and commercialize highly stable polymer-based products, including obtaining appropriate patent and proprietary rights protection.

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Lower cost, high production yield for these products.

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The ability to enable integration and implement advanced technologies.

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Strong sales and marketing channels for access to products.

We believe that our current business planning will position our Company to compete adequately with respect to these factors. Our future success is difficult to predict because we are an early stage company with all of our potential products still in development.

Many of our existing and potential competitors have substantially greater research and product development capabilities and financial, scientific, marketing and human resources than we do. As a result, these competitors may:

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Succeed in developing products that are equal to or superior to our potential products or that achieve greater market acceptance than our potential products.

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Devote greater resources to developing, marketing or selling their products.

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Respond quickly to new or emerging technologies or scientific advances and changes in customer requirements, which could render our technologies or potential products obsolete.

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Introduce products that make the continued development of our potential products uneconomical.

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Obtain patents that block or otherwise inhibit our ability to develop and commercialize our potential products.

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Withstand price competition more successfully than we can.

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Establish cooperative relationships among themselves or with third parties that enhance their ability to address the needs of our prospective customers.

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Take advantage of acquisition or other opportunities more readily than we can.

Our Laboratory Facilities

Our Company operates an organic synthesis and thin-films laboratory in Wilmington, Delaware. These facilities include state-of-the-art equipment including NMR, IR, UV/VIS and HPLC analytical systems, profilometry evaluation and electro-optic (r33) materials characterization necessary to produce next generation fiber-optic organic materials. We also utilize an electro-optic test facility in conjunction with local universities to perform critical evaluation tests (eg. R33) on our polymer material films and future electro-optic devices, such as our waveguides, modulators, and

all-optical transistors.

Item 1A.

Risk Factors

Investing in our common stock is risky. In addition to the other information in this report, you should consider carefully the following risk factors in evaluating us and our business. If any of the events described in the following risk factors were to occur, our business, financial condition or results of operations likely would suffer. In that event, the trading price of our common stock could decline, and you could lose all or a part of your investment.

We have incurred substantial operating losses since our inception and will continue to incur substantial operating losses for the foreseeable future.

Since our inception, we have been engaged primarily in the research and development of our polymer materials technologies and potential products. As a result of these activities, we incurred significant losses and experienced negative cash flow since our inception. We incurred a net loss of $4,340,607 for the year ended December 31, 2008 and $4,223,449 for the year ended December 31, 2007. We anticipate that we will continue to incur operating losses through at least 2009.

We may not be able to generate significant revenue either through development contracts from the U.S. government or government subcontractors or through customer contracts for our potential products or technologies. We expect to continue to make significant operating and capital expenditures for research and development and to improve and expand production, sales, marketing and administrative systems and processes. As a result, we will need to generate significant additional revenue to achieve profitability. We cannot assure you that we will ever achieve profitability.

These conditions raise substantial doubt to our auditors about our ability to continue as a going concern. Successful completion of our research and development program and, ultimately, the attainment of profitable operations is dependent upon future events, including our ability to obtain adequate financing to fulfill our development activities and achieving a level of sales adequate to support our Company's cost structure.

Our independent auditors have expressed substantial doubt about our ability to continue as a going concern

Our independent auditors have included an explanatory paragraph in their audit report issued in connection with our financial statements which states that our significant losses and negative cash flow during our development stage raise substantial doubt about our ability to continue as a going concern. Our financial statements do not include any adjustments that might result from the outcome of this uncertainty. Our ability to continue as a going concern is dependent upon our ability to successfully complete our development program and, ultimately, attain profitable operations, which is dependent upon future events, including obtaining adequate financing to fulfill our development activities and achieving a level of revenue adequate to support our cost structure. We cannot assure you that we will be able to secure the necessary financing and/or equity investment or achieve an adequate sales level.

We are subject to the risks frequently experienced by early stage companies.

The likelihood of our success must be considered in light of the risks frequently encountered by early stage companies, especially those formed to develop and market new technologies. These risks include our potential inability to:

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establish product sales and marketing capabilities;

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establish and maintain markets for our potential products;

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identify, attract, retain and motivate qualified personnel;

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continue to develop and upgrade our technologies to keep pace with changes in technology and the growth of markets using polymer materials;

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develop expanded product production facilities and outside contractor relationships;

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maintain our reputation and build trust with customers;

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improve existing and implement new transaction-processing, operational and financial systems;

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scale up from small pilot or prototype quantities to large quantities of product on a consistent basis;

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contract for or develop the internal skills needed to master large volume production of our products; and

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fund the capital expenditures required to develop volume production due to the limits of our available financial resources.

We are entering new markets, and if we fail to accurately predict growth in these new markets, we may suffer substantial losses.

We are devoting significant resources to engineer next-generation electro-optic plastics for future applications to be utilized by electro-optic device manufacturers, such as telecommunications component and systems manufacturers, networking and switching suppliers, semiconductor companies, aerospace companies and government agencies. We expect to continue to develop products for these markets and to seek to identify new markets. These markets change rapidly and we cannot assure you that they will grow or that we will be able to accurately forecast market demand, or lack thereof, in time to respond appropriately. Our investment of resources to develop products for these markets may either be insufficient to meet actual demand or result in expenses that are excessive in light of actual sales volumes. Failure to predict growth and demand accurately in new markets may cause us to suffer substantial losses. In addition, as we enter new markets, there is a significant risk that:

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the market may not accept the price and/or performance of our products;

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there may be issued patents we are not aware of that could block our entry into the market or could result in excessive litigation; and

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the time required for us to achieve market acceptance of our products may exceed our capital resources which would require additional investment.

The establishment and maintenance of collaborative relationships is critical to the success of our business.

We expect to sell many of our products directly to commercial customers or through potential industry partners. For example, we expect to sell our electro-optic plastic products to electro-optic device manufacturers, such as telecommunications component and systems manufacturers, networking and switching suppliers, semiconductor companies, aerospace companies and government agencies. Our ability to generate revenues depends significantly on the extent to which potential customers and other potential industry partners develop, promote and sell systems that incorporate our products. Any failure by potential customers and other potential industry partners to successfully develop and market systems that incorporate our products could adversely affect our sales. The extent to which

potential customers and other industry partners develop, promote and sell systems incorporating our products is based on a number of factors that are largely beyond our ability to control.

Our future growth will suffer if we do not achieve sufficient market acceptance of our electro-optic plastic products.

We are developing our electro-optic polymer products to be utilized by electro-optic device manufacturers, such as telecommunications component and systems manufacturers, networking and switching suppliers, semiconductor companies, aerospace companies and government agencies. All of our potential products are still in the development stage, and we do not know when a market for these products will develop, if at all. Our success depends, in part, upon our ability to gain market acceptance of our products. To be accepted, our products must meet the technical and performance requirements of our potential customers. OEMs, suppliers or government agencies may not accept polymer-based products. In addition, even if we achieve some degree of market acceptance for our potential products in one industry, we may not achieve market acceptance in other industries for which we are developing products. If the markets we are targeting fail to accept polymer-based products or determine that other products are superior, we may not be able to achieve market acceptance of our products.

Achieving market acceptance for our products will require marketing efforts and the expenditure of financial and other resources to create product awareness and demand by customers. We may be unable to offer products that compete effectively due to our limited resources and operating history. Also, certain large corporations may be predisposed against doing business with a company of our limited size and operating history. Failure to achieve broad acceptance of our products by customers and to compete effectively would harm our operating results.

Successful commercialization of our current and future products will require us to maintain a high level of technical expertise.

Technology in our target markets is undergoing rapid change. To succeed in our target markets, we will have to establish and maintain a leadership position in the technology supporting those markets. Accordingly, our success will depend on our ability to:

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accurately predict the needs of our target customers and develop, in a timely manner, the technology required to support those needs;

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provide products that are not only technologically sophisticated but are also available at a price acceptable to customers and competitive with comparable products;

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establish and effectively defend our intellectual property; and

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enter into relationships with other companies that have developed complementary technology into which our products may be integrated.

We cannot assure you that we will be able to achieve any of these objectives.

Two of our significant target markets are the telecommunications and networking markets, which continue to be subject to overcapacity and slow growth or decline.

Two of our significant target markets are the telecommunications and networking markets, and developments that adversely affect the telecommunications or networking markets, including delays in traffic growth and changes in U.S. government regulation, could slow down, or even halt our efforts to enter into these markets. Reduced spending and technology investment by telecommunications companies may make it more difficult for our products to gain market acceptance. Such companies may be less willing to purchase new technology such as ours or invest in new technology development when they have reduced capital expenditure budgets.

Many of our products will have long sales cycles, which may cause us to expend resources without an acceptable financial return and which makes it difficult to plan our expenses and forecast our revenues.

Many of our products will have long sales cycles that involve numerous steps, including initial customer contacts, specification writing, engineering design, prototype fabrication, pilot testing, device certification, regulatory approvals (if needed), sales and marketing and commercial manufacture. During this time, we may expend substantial financial resources and management time and effort without any assurance that product sales will result. The anticipated long sales cycle for some of our products makes it difficult to predict the quarter in which sales may occur. Delays in sales may cause us to expend resources without an acceptable financial return and make it difficult to plan expenses and forecast revenues.

We will require additional capital to continue to fund our operations. If we do not obtain additional capital, we may be required to substantially limit our operations.

Our business does not presently generate the cash needed to finance our current and anticipated operations. Based on our current operating plan and budgeted cash requirements, we believe that we will be able to fund our operations through at least May 2009. We will require additional capital to continue to fund our operations in future periods. We expect that we will need to seek additional funding through public or private financings, including equity financings, and through other arrangements, including collaborative arrangements. Poor financial results, unanticipated expenses or unanticipated opportunities could require additional financing sooner than we expect. We currently have no plans or arrangements with respect to the possible acquisition of additional financing, and such financing may be unavailable when we need it or may not be available on acceptable terms. Additional financing may not be available to us, due to, among other things, our Company not having a sufficient credit history, income stream, profit level, asset base eligible to be collateralized, or market for its securities. If we raise additional funds by issuing equity or convertible debt securities, the percentage ownership of our existing stockholders may be reduced, and these securities may have rights superior to those of our common stock. If adequate funds are not available to satisfy either short-term or long-term capital requirements, or if planned revenues are not generated, we may be required to limit our operations substantially. These limitations of operations may include reductions in capital expenditures and reductions in staff and discretionary costs.

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We may incur debt in the future that might be secured with our intellectual property as collateral, which could subject our Company to the risk of loss of all of our intellectual property.

If we incur debt in the future, we may be required to secure the debt with our intellectual property, including all of our patents and patent pendings. In the event we default on the debt, we could incur the loss of all of our intellectual property, which would materially and adversely affect our Company and cause you to lose your entire investment in our Company.

Our quarter-to-quarter performance may vary substantially, and this variance, as well as general market conditions, may cause our stock price to fluctuate greatly and potentially expose us to litigation.

We have generated no sales to date and we cannot accurately estimate future quarterly revenue and operating expenses based on historical performance. Our quarterly operating results may vary significantly based on many factors, including:

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fluctuating demand for our potential products and technologies;

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announcements or implementation by our competitors of technological innovations or new products;

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amount and timing of our costs related to our marketing efforts or other initiatives;

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the status of particular development programs and the timing of performance under specific development agreements;

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timing and amounts relating to the expansion of our operations;

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product shortages requiring suppliers to allocate minimum quantities;

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announcements or implementation by our competitors of technological innovations or new products;

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the status of particular development programs and the timing of performance under specific development agreements;

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our ability to enter into, renegotiate or renew key agreements;

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timing and amounts relating to the expansion of our operations;

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costs related to possible future acquisitions of technologies or businesses; or

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economic conditions specific to our industry, as well as general economic conditions.

Our current and future expense estimates are based, in large part, on estimates of future revenue, which is difficult to predict. We expect to continue to make significant operating and capital expenditures in the area of research and development and to invest in and expand production, sales, marketing and administrative systems and processes. We may be unable to, or may elect not to, adjust spending quickly enough to offset any unexpected revenue shortfall. If our increased expenses are not accompanied by increased revenue in the same quarter, our quarterly operating results would be harmed.

In one or more future quarters, our results of operations may fall below the expectations of investors and the trading price of our common stock may decline as a consequence. We believe that quarter-to-quarter comparisons of our operating results will not be a good indication of our future performance and should not be relied upon to predict the future performance of our stock price. In the past, companies that have

experienced volatility in the market price of their stock have often been subject to securities class action litigation. We may be the target of this type of litigation in the future. Securities litigation against us could result in substantial costs and divert our management's attention from other business concerns, which could seriously harm our business.

We cannot predict the pace of marketable products we may generate, and any inability to generate a sufficient number of marketable products would reduce our revenues and harm our business.

Our future revenues and profitability are dependent upon our ability to create marketable products, whether through our own research and development efforts or through collaborations with customers or industry partners. Because of the inherently uncertain nature of research and development activities, we cannot predict the pace of new product introductions. We must undertake additional research and development before we are able to develop additional products for commercial sale. Product development delays by us or potential product development partners, or the inability to enter into relationships with these potential partners, may delay or prevent us from introducing products for commercial sale. In addition, our product candidates may not result in products having the commercial potential we anticipate. Any of these factors could reduce our potential commercial sales and lead to inability to generate revenue and attain profitability.

Our failure to compete successfully could harm our business.

The markets that we are targeting for our electro-optic polymer technology are intensely competitive. Most of our present and potential competitors have or may have substantially greater research and product development capabilities, financial, scientific, marketing, manufacturing and human resources, name recognition and experience than we have. As a result, these competitors may:

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succeed in developing products that are equal to or superior to our potential products or that will achieve greater market acceptance than our potential products;

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devote greater resources to developing, marketing or selling their products;

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respond more quickly to new or emerging technologies or scientific advances and changes in customer requirements, which could render our technologies or potential products obsolete;

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introduce products that make the continued development of our potential products uneconomical;

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obtain patents that block or otherwise inhibit our ability to develop and commercialize our potential products;

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withstand price competition more successfully than we can;

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establish cooperative relationships among themselves or with third parties that enhance their ability to address the needs of our prospective customers; and

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take advantage of acquisitions or other opportunities more readily than we can.

The failure to compete successfully against these existing or future competitors could harm our business.

We may be unable to establish sales and marketing capabilities necessary to successfully commercialize our potential products.

We currently have limited sales and marketing capabilities. To date, we have relied upon our strategic partners to assist us in creating an awareness of our developing technology in both the government and commercial markets. We will need to either hire sales personnel with expertise in the markets we intend to address or contract with others to provide for sales support. Although our potential products are all based on our polymer materials technology, the potential products themselves address different markets and can be offered through multiple sales channels. Addressing each market effectively will require sales and marketing resources tailored to the particular market and to the sales channels that we choose to employ. In addition, the markets in which we operate are highly complex and technical; we may not have the adequate expertise to adequately market our products. We may be unable to establish marketing and sales capabilities necessary to commercialize and gain market acceptance for our potential products. Co-promotion or other marketing arrangements with others to commercialize products could significantly limit the revenues we derive from these products, and these parties may fail to commercialize such products successfully.

We may be unable to obtain effective intellectual property protection for our potential products and technology.

Our intellectual property, or any intellectual property that we have or may acquire, license or develop in the future, may not provide meaningful competitive advantages. Our patents and patent applications, including those we license, may be challenged by competitors, and the rights granted under such patents or patent applications may not provide meaningful proprietary protection. For example, numerous patents held by third parties relate to polymer materials and electro-optic devices. These patents could be used as a basis to challenge the validity or limit the scope of our patents or patent applications. A successful challenge to the validity or limitation of the scope of our patents or patent applications could limit our ability to commercialize our polymer materials technology and, consequently, reduce our revenues.

Moreover, competitors may infringe our patents or those that we license, or successfully avoid these patents through design innovation. To combat infringement or unauthorized use, we may need to resort to litigation, which can be expensive and time-consuming and may not succeed in protecting our proprietary rights. In addition, in an infringement proceeding a court may decide that our patents or other intellectual property rights are not valid or are unenforceable, or may refuse to stop the other party from using the intellectual property at issue on the ground that it is non-infringing. Policing unauthorized use of our intellectual property is difficult and expensive, and we may not be able to, or have the resources to, prevent misappropriation of our proprietary rights, particularly in countries where the laws may not protect these rights as fully as the laws of the United States.

We also rely on the law of trade secrets to protect unpatented technology and know-how. We try to protect this technology and know-how by limiting access to those employees, contractors and strategic partners with a need to know this information and by entering into confidentiality agreements with these parties. Any of these parties could breach the agreements and disclose our trade secrets or confidential information to our

29

competitors, or these competitors might learn of the information in other ways. Disclosure of any trade secret not protected by a patent could materially harm our business.

We may be subject to patent infringement claims, which could result in substantial costs and liability and prevent us from commercializing our potential products.

Third parties may claim that our potential products or related technologies infringe their patents. Any patent infringement claims brought against us may cause us to incur significant expenses, divert the attention of our management and key personnel from other business concerns and, if successfully asserted against us, require us to pay substantial damages. In addition, as a result of a patent infringement suit, we may be forced to stop or delay developing, manufacturing or selling potential products that are claimed to infringe a patent covering a third party's intellectual property unless that party grants us rights to use its intellectual property. We may be unable to obtain these rights on terms acceptable to us, if at all. Even if we are able to obtain rights to a third party's patented intellectual property, these rights may be non-exclusive, and therefore our competitors may obtain access to the same intellectual property. Ultimately, we may be unable to commercialize our potential products or may have to cease some of our business operations as a result of patent infringement claims, which could severely harm our business.

If our potential products infringe the intellectual property rights of others, we may be required to indemnify customers for any damages they suffer. Third parties may assert infringement claims against our current or potential customers. These claims may require us to initiate or defend protracted and costly litigation on behalf of customers, regardless of the merits of these claims. If any of these claims succeed, we may be forced to pay damages on behalf of these customers or may be required to obtain licenses for the products they use. If we cannot obtain all necessary licenses on commercially reasonable terms, we may be unable to continue selling such products.

Our technology may be subject to government rights and retained research institution rights.

We may have obligations to government agencies or universities in connection with the technology that we have developed, including the right to require that a compulsory license be granted to one or more third parties selected by certain government agencies. In addition, academic research partners often retain certain rights, including the right to use the technology for noncommercial academic and research use, to publish general scientific findings from research related to the technology, and to make customary scientific and scholarly disclosures of information relating to the technology. It is difficult to monitor whether our partners will limit their use of the technology to these uses, and we could incur substantial expenses to enforce our rights to our licensed technology in the event of misuse.

The loss of certain of our key personnel, or any inability to attract and retain additional personnel, could impair our ability to attain our business objectives.

Our future success depends to a significant extent on the continued service of our key management personnel, particularly James S. Marcelli, our Chief Executive Officer,

Frederick J. Goetz, Jr. our Chief Science Officer, and Dr. David F. Eaton our Chief Technology Officer. We currently do not maintain key person life insurance on any executive officer. Accordingly, the loss of the services of any of these persons would adversely affect our business and our ability to timely commercialize our products, and impede the attainment of our business objectives.

Our future success will also depend on our ability to attract, retain and motivate highly skilled personnel to assist us with product development and commercialization. Competition for highly educated qualified personnel in the polymer industry is intense. If we fail to hire and retain a sufficient number of qualified management, engineering, sales and technical personnel, we will not be able to attain our business objectives.

If we fail to develop and maintain the quality of our manufacturing processes, our operating results would be harmed.

The manufacture of our potential products is a multi-stage process that requires the use of high-quality materials and advanced manufacturing technologies. Also, polymer-related device development and manufacturing must occur in a highly controlled, clean environment to minimize particles and other yield and quality-limiting contaminants. In spite of stringent quality controls, weaknesses in process control or minute impurities in materials may cause a substantial percentage of a product in a lot to be defective. If we are not able to develop and continue to improve on our manufacturing processes or to maintain stringent quality controls, or if contamination problems arise, our operating results would be harmed.

We may utilize third parties to manufacture our current products and our revenues could decline if these third parties do not timely complete our orders and our reputation could suffer if we do not maintain high quality standards.

We may enter into manufacturing arrangements with third party manufacturers and we intend to enter into agreements with additional corporate partners, OEMs and other third parties. We expect to contract with manufacturing companies to perform various portions of our product manufacturing, testing, assembly and shipping and purchase components to be used in our potential products from third-party vendors. If these third parties do not timely complete our orders, or do not properly manufacture our products, our reputation could be harmed, and our revenues could decline. We cannot assure you that we will be able to negotiate arrangements with these third parties on acceptable terms, if at all, or that these arrangements will be successful in yielding commercially viable products. If we cannot maintain our current relationships or establish new arrangements, we will require additional capital to undertake those activities on our own and will require manufacturing expertise that we do not currently possess and that may be difficult to obtain.

If we decide to make commercial quantities of products at our facilities, we will be required to make significant capital expenditures to increase capacity.

We lack the internal ability to manufacture products at a level beyond the stage of early commercial introduction. To the extent we do not have an outside vendor to manufacture our products, we will have to increase our internal production capacity and we will be required to expand our existing facilities or to lease or construct new facilities

or to acquire entities with additional production capacities. These activities would require us to make significant capital investments and may require us to seek additional equity or debt financing. We cannot assure you that such financing would be available to us when needed on acceptable terms, or at all. If we are unable to expand internal production capacity on a timely basis to meet increases in demand, we could lose market opportunities for sales. Further, we cannot assure you that any increased demand for our potential products would continue for a sufficient period of time to recoup our capital investments associated with increasing our internal production capacity.

In addition, we do not have experience manufacturing our potential products in large quantities. In the event of significant demand for our potential products, large-scale production might prove more difficult or costly than we anticipate and lead to quality control issues and production delays.

We may not be able to manufacture products at competitive prices.

To date, we have produced limited quantities of products for research, development and demonstration purposes. The cost per unit for these products currently exceeds the price at which we could expect to profitably sell them. If we cannot substantially lower our cost of production as we move into sales of products in commercial quantities, our financial results will be harmed.

We conduct significantly all of our research and development activities at a single facility, and circumstances beyond our control may result in considerable interruptions.

We conduct significantly all of our research and development activities at a single facility in Wilmington, Delaware. A disaster such as a fire, flood or severe storm at or near this facility could prevent us from further developing our technologies or manufacturing our potential products, which would harm our business.

We could be exposed to significant product liability claims that could be time-consuming and costly and impair our ability to obtain and maintain insurance coverage.

We may be subject to product liability claims if any of our potential products are alleged to be defective or harmful. Product liability claims or other claims related to our potential products, regardless of their outcome, could require us to spend significant time and money in litigation, divert our management's time and attention from other business concerns, require us to pay significant damages, harm our reputation or hinder acceptance of our potential products. Any successful product liability claim may prevent us from obtaining adequate product liability insurance in the future on commercially reasonable terms. Any inability to obtain sufficient insurance coverage at an acceptable cost or otherwise to protect against potential product liability claims could impair our ability to commercialize our potential products.

We may be unable to effectively implement new transaction accounting, operational and financial systems.

To manage the expected growth of our operations and personnel, we will be required to implement complex transaction accounting, operational and financial systems, procedures and controls and to retain personnel experienced in the use of these systems.

Deficiencies in the design and operation of our systems, procedures and controls, including internal controls, could adversely affect our ability to record, process, summarize and report material financial information. We cannot assure you that our current and planned systems, procedures and controls will be adequate to support our future operations.

Our failure to effectively manage and support our growth could adversely affect our business.

Failure to effectively manage and support our growth could adversely affect our business. To date, substantially all of our activities and resources have been directed at the research and development of our technology and development of potential products. The transition from research and development to a product vendor or licensor will create significant additional demands on our infrastructure and will require effective planning and management. We cannot assure you that our resources will be adequate to support our future growth. In addition, future expansion will be expensive and will likely strain our management and other resources. In order to effectively manage growth, we must:

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manage in-house our operating and financial control systems;

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continue to develop an effective planning and management process to implement our business strategy;

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hire, train and integrate new personnel in all areas of our business; and

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expand our facilities and increase our capital investments.

We cannot assure you that we will be able to accomplish these tasks effectively or otherwise effectively manage our growth.

We are subject to regulatory compliance related to our operations.

We are subject to various U.S. governmental regulations related to occupational safety and health, labor and business practices. Failure to comply with current or future regulations could result in the imposition of substantial fines, suspension of production, alterations of our production processes, cessation of operations, or other actions, which could harm our business.

We may be unable to export our potential products or technology to other countries, convey information about our technology to citizens of other countries or sell certain products commercially, if the products or technology are subject to United States export or other regulations.

We are developing certain polymer-based products that we believe the United States government and other governments may be interested in using for military and information gathering or antiterrorism activities. United States government export regulations may restrict us from selling or exporting these potential products into other countries, exporting our technology to those countries, conveying information about our technology to citizens of other countries or selling these potential products to commercial customers. We may be unable to obtain export licenses for products or technology if necessary. We currently cannot assess whether national security concerns would affect our potential products and, if so, what procedures and policies we would have to adopt to

comply with applicable existing or future regulations.

We may incur liability arising from the use of hazardous materials.

Our business and our facilities are subject to a number of federal, state and local laws and regulations relating to the generation, handling, treatment, storage and disposal of certain toxic or hazardous materials and waste products that we use or generate in our operations. Many of these environmental laws and regulations subject current or previous owners or occupiers of land to liability for the costs of investigation, removal or remediation of hazardous materials. In addition, these laws and regulations typically impose liability regardless of whether the owner or occupier knew of, or was responsible for, the presence of any hazardous materials and regardless of whether the actions that led to the presence were taken in compliance with the law. In our business, we use hazardous materials that are stored on site. We use various chemicals in our manufacturing process that may be toxic and covered by various environmental controls. The waste created by use of these materials is transported off-site by an unaffiliated waste hauler. Many environmental laws and regulations require generators of waste to take remedial actions at an off-site disposal location even if the disposal was conducted lawfully. The requirements of these laws and regulations are complex, change frequently and could become more stringent in the future. Failure to comply with current or future environmental laws and regulations could result in the imposition of substantial fines, suspension of production, alteration of our production processes, cessation of operations or other actions, which could severely harm our business.

Our plan to develop relationships with strategic partners may not be successful.

Part of our business strategy is to maintain and develop strategic relationships with government agencies, private firms, and academic institutions to conduct research and development of technologies and products. For these efforts to be successful, we must identify partners whose competencies complement ours. We must also successfully enter into agreements with them on terms attractive to us, and integrate and coordinate their resources and capabilities with our own. We may be unsuccessful in entering into agreements with acceptable partners or negotiating favorable terms in these agreements. Also, we may be unsuccessful in integrating the resources or capabilities of these partners. In addition, our strategic partners may prove difficult to work with or less skilled than we originally expected. If we are unsuccessful in our collaborative efforts, our ability to develop and market products could be severely limited.

As our business grows, if we need to establish global operations, we will be subject to various risks.

Many of the markets that we propose to address are global and may require us to conduct foreign operations, including the establishment of sales, manufacturing and possible research and development facilities in other countries. While the specific risks that will apply to these activities would depend on the circumstances, we could become subject to risks relating to foreign currency fluctuations, political and social unrest, local regulatory systems and varying standards for the protection of intellectual property. The existence of any of these risks will complicate our business and may lead to unexpected and adverse effects on our business. If we are required to conduct significant foreign operations, we will also need expertise in such operations, which we do not presently

34

have.

Our limited operating history makes financial forecasting difficult for us and for others that may publish estimates of our future financial results.

As a result of our limited operating history, it is difficult to accurately forecast our revenue and results, including product sales, cost of revenue, research and development expenses, marketing, general and administrative expenses and other financial and operating data. We have a limited amount of meaningful historical financial data upon which to base projected revenue or expenses. We base our current expense levels and estimates of future expense levels on our operating plans and estimates of future revenue, and our future expenses will be dependent in large part upon our future levels of product sales. Sales and results are difficult to forecast because we do not currently have any commercial customers or government contracts, we are uncertain of the extent of orders for our products and the mix, volume and timing of any such orders. As a result, we may be unable to make accurate financial forecasts of revenue or expenses. Financial analysts and others that may seek to project our future performance face similar difficulties. This inability to accurately forecast our revenue and expenses could cause our financial results to differ materially from any projected financial results and could cause a decline in the trading price of our common stock.

Item 1B.

Unresolved Staff Comments.

Not Applicable

Item 2.

Properties.

Our executive and business office headquarters are located at 121 Continental Drive, Suite 110, Newark, Delaware 19713. We coordinate our operations and market our services from this space. We lease this space on a month-to-month basis at fair market value rates from a third party. Our monthly rent for this space is $725.

We also lease approximately 1,400 square feet of laboratory space at 41A Germay Drive, Wilmington, Delaware 19804. We operate an organic synthesis and thin-films laboratory from this facility, which has state-of-the-art equipment including NMR, IR, UV/VIS and HPLC analytical systems, profilometry evaluation and electro-optic (r33) materials characterization necessary to produce next generation fiber-optic organic materials. We lease this space at fair market value rates from a third party. The lease expires on June 30, 2009 and the monthly rent for the space is $737.

Item 3.

Legal Proceedings.

During the spring of 2005, we raised $1,000,000 through the sale of 4,000,000 shares of our common stock in a limited offering to persons considered to be accredited investors. Our Company received a legal opinion from outside counsel as to the availability of an exemption from registration with the Securities and Exchange Commission (the "SEC" or "Commission") with respect to the limited offering.

In December 2005, we were informed by the Commission that it is investigating the circumstances surrounding the $1,000,000 offering described above including the subsequent public resale of certain shares originally sold in the offering, along with related matters. Our Company has further been informed that the original issuance of the stock and subsequent resale thereof may have been done, in the opinion of the Commission, in violation of the registration provisions of the Securities Act of 1933, as amended. These matters could lead to enforcement action by the Commission. Our Company has committed to cooperate fully with the Commission with the intention that all issues will be resolved as quickly as possible.

We are not aware of any litigation or threatened litigation of a material nature.

Item 4.

Submission Of Matters To A Vote Of Security Holders.

No matter was submitted to a vote of our security holders during the fourth quarter of the fiscal year covered by this report.

PART II

Item 5.

Market For Registrant s Common Equity, Related Stockholder Matters and Issuer Purchases Of Equity Securities.

Market Information

Our common stock is currently traded under the symbol LWLG on the on the over-the-counter bulletin board ("**OTCBB**").

The following table set forth below lists the range of high and low bids for our common stock for each fiscal quarter for the last two fiscal years. The prices in the table reflect inter-dealer prices, without retail markup, markdown or commission and may not represent actual transactions.

		High		Low	
		Bid	Ask	Bid	Ask
2007	1st Quarter	$0.72	$0.74	$0.42	$0.48
	2nd Quarter	$0.92	$0.95	$0.56	$0.59
	3rd Quarter	$0.77	$0.79	$0.40	$0.45
	4th Quarter	$0.91	$0.94	$0.55	$0.58
2008	1st Quarter	$2.15	$2.20	$0.70	$0.73
	2nd Quarter	$2.66	$2.70	$1.21	$1.23
	3rd Quarter	$2.03	$2.05	$0.53	$0.02
	4th Quarter	$1.08	$1.03	$0.26	$0.30

Holders

As of the date of this annual report, we have a total of 37,969,042 shares of common stock outstanding, held of record by approximately 1,978 shareholders. We do not have any shares of preferred stock outstanding.

Dividends

No cash dividends have been declared or paid on our common stock to date. No restrictions limit our ability to pay dividends on our common stock. The payment of cash dividends in the future, if any, will be contingent upon our Company's revenues and earnings, if any, capital requirements and general financial condition. The payment of any dividends is within the discretion of our board of directors. Our board of director's present intention is to retain all earnings, if any, for use in our business operations and, accordingly, the board of directors does not anticipate paying any cash dividends in the foreseeable future.

Securities Authorized for Issuance under Equity Compensation Plans

Equity Compensation Plans as of December 31, 2008.

Equity Compensation Plan Information

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)	Weighted-average exercise price of outstanding options, warrants and rights (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
Equity compensation plans approved by security holders (1)	3,152,000	$1.25	348,000
Equity compensation plans not approved by security holders (2)	2,822,200	$0.32	0
Total	5,974,200	$0.81	348,000

1.

Reflects our 2007 Employee Stock Plan for the benefit of our directors, officers, employees and consultants. We initially reserved 3,500,000 shares of common stock for such persons pursuant to that plan.

2.

Comprised of common stock purchase warrants we issued to consultants.

Penny Stock Regulations and Restrictions on Marketability

The SEC has adopted rules that regulate broker-dealer practices in connection with transactions in penny stocks. Penny stocks are generally equity securities with a market price of less than $5.00, other than securities registered on certain national securities exchanges or quoted on the NASDAQ system, provided that current price and volume

information with respect to transactions in such securities is provided by the exchange or system. The penny stock rules require a broker-dealer, prior to a transaction in a penny stock, to deliver a standardized risk disclosure document prepared by the SEC, that: (a) contains a description of the nature and level of risk in the market for penny stocks in both public offerings and secondary trading; (b) contains a description of the broker's or dealer's duties to the customer and of the rights and remedies available to the customer with respect to a violation of such duties or other requirements of the securities laws; (c) contains a brief, clear, narrative description of a dealer market, including bid and ask prices for penny stocks and the significance of the spread between the bid and ask price; (d) contains a toll-free telephone number for inquiries on disciplinary actions; (e) defines significant terms in the disclosure document or in the conduct of trading in penny stocks; and (f) contains such other information and is in such form, including language, type size and format, as the SEC shall require by rule or regulation.

The broker-dealer also must provide, prior to effecting any transaction in a penny stock, the customer with (a) bid and offer quotations for the penny stock; (b) the compensation of the broker-dealer and its salesperson in the transaction; (c) the number of shares to which such bid and ask prices apply, or other comparable information relating to the depth and liquidity of the market for such stock; and (d) a monthly account statement showing the market value of each penny stock held in the customer's account.

In addition, the penny stock rules require that prior to a transaction in a penny stock not otherwise exempt from those rules, the broker-dealer must make a special written determination that the penny stock is a suitable investment for the purchaser and receive the purchaser's written acknowledgment of the receipt of a risk disclosure statement, a written agreement as to transactions involving penny stocks, and a signed and dated copy of a written suitability statement.

These disclosure requirements may have the effect of reducing the trading activity for our common stock. Therefore, stockholders may have difficulty selling our securities.

Recent Sales of Unregistered Securities

During the period covered by this report, our Company has sold the following securities without registering the securities under the Securities Act:

Common Stock

During January through August 2008, warrant holders exercised warrants to purchase 270,000 shares of our common stock at $0.50 per share for proceeds of $135,000.

During October 2008, our board of directors authorized the Company to raise up to $600,000 of capital through an incentive to current warrant holders that provided eligible warrant holders with the opportunity to purchase four (4) shares of common stock for each dollar invested pursuant to their existing warrant agreement. As of December 31, 2008, warrants to purchase 641,080 shares of common stock were exercised with proceeds of $160,270.

No underwriters were utilized and no commissions or fees were paid with respect to any of the above transactions. These persons were the only offerees in connection with these transactions. We relied on Section 4(2) and Rule 506 of Regulation D of the Securities Act since the transaction does not involve any public offering.

Item 6.

Selected Financial Data.

Not Applicable.

Item 7.

Management's Discussion And Analysis Of Financial Condition And Results Of Operations.

The following management's discussion and analysis of financial condition and results of operations provides information that management believes is relevant to an

assessment and understanding of our plans and financial condition. The following selected financial information is derived from our historical financial statements and should be read in conjunction with such financial statements and notes thereto set forth elsewhere herein and the "Forward-Looking Statements" explanation included herein.

Overview

Lightwave Logic, Inc., formerly, Third-Order Nanotechnologies, Inc., formerly, PSI-TEC Holdings, Inc., formerly Eastern Idaho Internet Service, Inc. was organized under the laws of the State of Nevada in 1997, where we engaged in the business of marketing Internet services until June 30, 1998 when our operations were discontinued. We were then inactive until we acquired PSI-TEC Corporation as our wholly owned subsidiary on July 14, 2004, at which time our name was changed to PSI-TEC Holdings, Inc. On October 20, 2006, we completed a parent-subsidiary merger with PSI-TEC Corporation whereby we were the surviving corporation of the merger, and our name was changed to Third-Order Nanotechnologies, Inc. On March 10, 2008, we changed our name to Lightwave Logic, Inc. to better suit our strategic business plan and to facilitate stockholder recognition of our Company and its business.

We are a developmental stage company that has developed and continues to develop high-activity, high-stability electro-optic polymers (plastics) that we believe could have a broad range of applications in the electro-optic device market. We engineer our proprietary electro-optic plastics at the molecular level for superior performance, stability, cost-efficiency and ease of processability. We expect our electro-optic plastics to broadly replace more expensive, lower-performance materials that are currently used in fiber-optic ground, wireless and satellite communication networks.

In order to transmit digital information at extremely high-speeds (wide bandwidth) over the Internet, it is necessary to convert the electrical signals produced by a computer into optical signals for transmission over long-distance fiber-optic cable. The actual conversion of electricity to an optical signal may be performed by a molecularly-engineered material known as an electro-optic plastic.

We are currently developing electro-optic plastics that promise performance many times faster than any technology currently available and that have unprecedented thermal stability. High-performance electro-optic materials produced by our Company have demonstrated stability as high as 350 degrees Celsius. Stability above 300 degrees Celsius is necessary for vertical integration into many semi-conductor production lines. Recent results, independently confirmed by the University of Arizona, have demonstrated that the molecular performance of some of our Company's molecular designs perform 650% better than competitive electro-optic compounds.

Our revenue model relies substantially on the assumption that we will be able to successfully develop electro-optic products for applications within the industries described below. When appropriate, we intend to create specific materials for each of these applications and use our proprietary knowledge base to continue to enhance its discoveries.

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Satellite Reconnaissance

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Navigational Systems

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Radar Applications

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Telecommunications

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Backplane Optical Interconnects

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Entertainment

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Medical Applications

To be successful, we must, among other things:

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Develop and maintain collaborative relationships with strategic partners;

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Continue to expand our research and development efforts for our products;

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Develop and continue to improve on our manufacturing processes and maintain stringent quality controls;

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Produce commercial quantities of our products at commercially acceptable prices;

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Rapidly respond to technological advancements;

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Attract, retain and motivate qualified personnel; and

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Obtain and retain effective intellectual property protection for our products and technology.

We believe that Moore's Law (a principle which states the number of transistors on a silicon chip doubles approximately every eighteen months) will create markets for our high-performance electro-optic material products.

Plan of Operation

Since our inception, we have been engaged primarily in the research and development of our polymer materials technologies and potential products. We are devoting significant resources to engineer next-generation electro-optic plastics for future applications to be utilized by electro-optic device manufacturers, such as telecommunications component and systems manufacturers, networking and switching suppliers, semiconductor companies, aerospace companies and government agencies. We expect to continue to develop products that we intend to introduce to these rapidly changing markets and to seek to identify new markets. We expect to continue to make significant operating and capital expenditures for research and development activities.

As we move from a development stage company to a product vendor, we expect that our financial condition and results of operations will undergo substantial change. In particular, we expect to record both revenue and expense from product sales, to incur increased costs for sales and marketing and to increase general and administrative expense. Accordingly, the financial condition and results of operations reflected in our historical financial statements are not expected to be indicative of our future financial condition and results of operations.

On August 8, 2006, we contracted with Triple Play Communications Corporation, a design and market consulting company, to deliver a comprehensive market opportunity assessment report for high speed 40G (commercial) & 100G+ (military/aerospace) modulators and system applications.

In August, 2006 we entered into a co-location agreement with InPlane Photonics,

a New Jersey-based micro-optics company that allowed our scientists to establish a pre-production line in order to test and integrate our organic materials into waveguide devices and system prototypes as a first step toward product commercialization. This agreement was terminated at the end of January 2007 so that we could focus on pursuing a strategic relationship with Photon-X LLC, a Pennsylvania-based firm with extensive experience in polymer waveguide processing. We entered into a non-binding memorandum of understanding with Photon-X, LLC in December 2006 to work towards creating a fee for services agreement with Photon-X, LLC to design, develop, produce and market electro-optic components based upon our polymer technology, which we ultimately finalized in March 2007. This agreement with Photon-X, LLC enables our Company access to a full suite of fabrication facilities capable of producing commercial quantities of precision micro-optic devices such as high-speed (40GHz) telecom modulators, optical filters, and optical interconnects important to military and civilian global information movement and management markets.

On September 25, 2006 we obtained independent laboratory results that confirmed the thermal stability of our Perkinamine electro-optic materials. Thermal stability as high as 350 degrees Celsius was confirmed, significantly exceeding many other commercially available high performance electro-optic materials, such as CLD-1 which exhibits thermal degradation in the range of 250 degrees Celsius to 275 degrees Celsius. This high temperature stability of our materials eliminates a major obstacle to vertical integration of electro-optic polymers into standard microelectronic manufacturing processes (e.g. wave/vapor-phase soldering) where thermal stability of at least 300 degrees Celsius is required. In independent laboratory tests, ten-percent material degradation, a common evaluation of overall thermal stability, did not occur until our Perkinamine material base was exposed to temperatures as high as 350 degrees Celsius, as determined by Thermo-Gravimetric Analysis (TGA). The test results supported our Company's progress to introduce our materials into commercial applications such as optical interconnections, high-speed telecom and datacom modulators, and military/aerospace components.

In July 2007, our Company developed an innovative process to integrate our unique architecture into our anticipated commercial devices, whereby dendritic spacer systems are attached to its core chromophore. In the event we are successful in developing a commercially viable product, we believe these dendrimers will reduce the cost of manufacturing materials and reduce the cost and complexity of tailoring the material to specific customer requirements.

In January 2008, we retained TangibleFuture, Inc., a San Francisco based technology analysis and business development consulting company, to generate an independent assessment of our business opportunities in the fiber-optic telecommunications and optical computing sectors and develop strategies to penetrate those potential markets.

In March 2008, we commenced production of our first prototype photonic chip, which we delivered to Photon-X, LLC to fabricate a prototype polymer optical modulator and measure its technical properties. As a result of delays caused by engineering setbacks related to our material production, the production of our first prototype photonic chip was temporarily halted, along with the completion of our proof of concept tests that were being administered by Dr. Robert Norwood at the University of Arizona Photonics Department. In order to address this issue, Dr. David Eaton s role and responsibilities

42

with the Company were significantly expanded, and we added two veteran synthetic chemists to our science and technology team. We now believe we have overcome these engineering setbacks and we believe we are prepared to start our next phase of testing for material performance (r33) Teng-Man testing protocol in order to re-confirm previous test results. Once again, we intend to deliver independent validated r33 test results necessary for secondary proof of concept testing, as we have in the past. We may incur delays in this process due to slower than expected material production within our laboratories and/or delays caused by the testing procedures. Should these tests produce a functional 10 Gb/s or greater modulator we expect to go forward with product development and marketing in the telecommunication market with partners in the telecommunication field. We cannot anticipate the details of the customer adoption cycle until we have produced a functional prototype to create a credible technology offering. Further, our management is in the process of developing a business plan that it believes will be attractive enough to investors to raise the necessary capital to continue to maintain our operations. However, we cannot assure you that we will be able to secure the necessary financing and/or equity investment or achieve an adequate sales level to do so. Successful completion of our prototype could lead to adequate financing to fulfill our development activities and achieve a level of revenue adequate to support our Company s cost structure for the following three years.

We ultimately intend to use our next-generation electro-optic plastics for future applications vital to the following industries. We expect to create specific materials for each of these applications as appropriate:

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Satellite Reconnaissance

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Navigational Systems

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Radar Applications

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Telecommunications

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Backplane Optical Interconnects

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Entertainment

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Medical Applications

In an effort to maximize our future revenue stream from our electro-optic polymer products, we are currently evaluating each of or some combination of the following approaches:

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Licensing our technology for individual specific applications;

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Entering into collaborative or joint venture agreements with one or a number of partners; or

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Selling our products directly to commercial customers.

Additionally, we must create an infrastructure, including operational and financial systems, and related internal controls, and recruit qualified personnel. Failure to do so could adversely affect our ability to support our operations.

We have incurred substantial net losses since inception. We have satisfied our capital requirements since inception primarily through the issuance and sale of our common stock. During 2004 we raised approximately $529,000 from the issuance of convertible promissory notes, of which $30,000 was converted into common stock of the

company during 2004 and the remaining $499,000 converted in 2005. Also, during 2005, we raised an aggregate of $1,000,000 from the private sale of our common stock. During 2006, we raised approximately $425,000 from the private sale of our common stock, of which $200,000 was rescinded during 2007. During 2007, we raised approximately $2,301,524 from the private sale of our common stock. During 2008, we raised approximately $414,000 from the private sale of our common stock and $375,270 upon the exercise of existing warrant holder s warrants.

We have also issued shares of our common stock and warrants to purchase shares of our common stock in exchange for services rendered to our company, including professional services.

Award

On September 26, 2006, we were awarded the 2006 Electro-Optic Materials Technology Innovation of the Year Award by Frost & Sullivan. Frost & Sullivan's Technology Innovation of the Year Award is bestowed upon candidates whose original research has resulted in innovations that have, or are expected to bring, significant contributions to multiple industries in terms of adoption, change, and competitive posture. This award recognizes the quality and depth of our Company's research and development program as well as the vision and risk-taking that enabled us to undertake such an endeavor.

Results of Operations

Comparison of Fiscal 2008 to Fiscal 2007

Revenues

We had no revenues in fiscal 2008 or 2007 since we are a development stage company that has yet to commence revenue creating operations.

Operating Expenses

Our operating expenses were $4,242,353 and $4,228,748 for the years ended December 31, 2008 and 2007, respectively, for an increase of $13,605.

Included in our operating expenses for 2008 was $2,845,956 for research and development expenses compared to $1,455,608 for 2007 which is an increase of $1,390,348. Research and development expenses currently consist primarily of compensation for employees and contractors engaged in internal research and product development activities; laboratory operations, outsourced development and processing work; fees and expenses related to patent applications and intellectual property protection; costs incurred in acquiring and maintaining licenses; and related operating expenses. The increase is primarily due to increase in employee and non-cash consulting stock compensation and option amortization.

Wages and salaries increased $888,435 from $607,056 in 2007 to $1,495,491 in 2008 due to the amortization of employee options, employee stock compensation and an increase in wages. Consultant expense was $1,194,332 in 2008 and $551,015 in 2007. The increase of $643,317 was due to additional consulting services being used during 2008. Payroll tax of $49,885 and $29,158 was paid during 2008 and 2007. The increase of $20,727 is due to the greater payroll expenses incurred in 2008. Health insurance expenses increased $17,284 from $25,520 in 2007 to $42,804 in 2008 due to an increase of health insurance expenses and payroll.

We expect to continue to incur substantial research and development expense to develop commercial products that utilize our electro-optic plastics. These expenses could increase as a result of continued development and commercialization of our electro-optic materials technology; subcontracting work to potential development partners; expanding and equipping in-house laboratories; hiring additional technical and support personnel; pursuing other potential business opportunities; and incurring related operating expenses.

General and administrative expense consists primarily of compensation and support costs for management and administrative staff, and for other general and administrative costs, including executive, investor relations, accounting and finance, legal, consulting and other operating expenses, including laboratory space rental costs.

General and administrative expenses decreased $1,376,743 to $1,396,397 for 2008 compared to $2,773,140 for 2007. The decrease is due primarily to our decreases in management fees, consulting fees and investor relations expenses.

General consulting services in general and administrative expenses in 2007 of $743,114 were not incurred in 2008 since the agreements for services terminated. The Company retained a market research firm during 2008 to assist in market research and the development of the Company s commercial business plan. The 2008 expenditures totaled $75,519.

Management fees decreased $341,996 to $431,337 from $773,333 in 2007 as a result of a new management contract in March 2008. Investor relations fees decreased $370,587 from $436,318 in 2007 to $65,731 in 2008 due to end of the contract with the company s investor relations firm.

Accounting and auditing fees were $85,558 and $99,986 in 2008 and 2007, respectively. The decrease of $14,428 was primarily due to the fees associated with restating financial statements. Legal fees decreased $9,816 to $175,408 in 2008 compared to $185,224 in 2007 due to the settlement of a lawsuit in 2007.

Travel expenses increased $17,785 to $32,704 in 2008 compared to $14,919 in 2007 due to additional travel and business related expenses incurred in 2008.

We expect general and administrative expense to increase in future periods as we increase the level of corporate and administrative activity, including increases associated with our operation as a public company; and significantly increase expenditures related to the future production and sales of our products.

Other Income (Expense)

Total other income (expense) was a net loss of $98,254 in the year ended December 31, 2008, consisting of $59,276 realized loss on a related party investment and $2,911 of interest expense, offset by $11,409 of interest income on cash deposits and short term investments and $24 of dividend income, compared to other income of $5,299 in the year ended December 31, 2007, consisting of $10,548 of interest income on cash deposits and short term investments, $637 of realized gain on investment, offset by $5,886 of interest expense. Other expense of $47,500 represents the settlement of a lawsuit.

Net Loss

Net loss was $4,340,607 and $4,223,449 for the years ended December 31, 2008 and 2007, respectively, for an increase of $117,158, primarily resulting from research and development and general and administrative expenses incurred as described above.

Significant Accounting Policies

The Company's accounting policies are more fully described in Note 1 of Notes to Financial Statements. As disclosed in Note 1 of Notes to Financial Statements, the preparation of financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions about future events that affect the amounts reported in the financial statements and accompanying notes. Future events and their effects cannot be determined with absolute certainty. Therefore, the determination of estimates requires the

exercise of judgment. Actual results inevitably will differ from those estimates, and such differences may be material to the financial statements. The Company believes that, of its significant accounting policies, the following may involve a higher degree of judgment, estimation, or complexity than other accounting policies.

Merger

On July 14, 2004, the Company acquired PSI-TEC. Under the terms of the merger agreement, the stockholders of PSI-TEC received 15,600,000 shares of common stock in exchange for its 2,206,280 shares. Following the merger, the Company changed

its name to PSI-TEC Holdings, Inc. Under accounting principles generally accepted in the United States, the share exchange is considered to be a capital transaction in substance rather than a business combination. That is, the share exchange is equivalent to the issuance of stock by PSI-TEC Holdings, Inc. for the net monetary assets of PSI-TEC, accompanied by a recapitalization, and is accounted for as a change of capital structure. Accordingly, the accounting for the share exchange will be identical to that resulting from a reverse acquisition, except no goodwill will be recorded. Under reverse takeover accounting, the post-reverse acquisition comparative historical financial statements of the legal acquirer, PSI-TEC Holdings, Inc., are those of the legal acquiree, PSI-TEC, which is considered to be the accounting acquirer. On October 20, 2006, PSI-TEC Holdings, Inc. and PSI-TEC merged and changed its name to Third-Order Nanotechnologies, Inc. On March 10, 2008, Third-Order Nanotechnologies, Inc. changed its name to Lightwave Logic, Inc.

Stock Based Compensation

In December 2004, the Financial Accounting Standards Board ("FASB") issued SFAS 123 (revised 2004), Share-Based Payment ("SFAS 123R"). SFAS 123(R) supersedes APB Opinion No. 25, Accounting for Stock Issued to Employees, and amends SFAS No. 95, Statement of Cash Flows. Generally, the approach in SFAS 123(R) is similar to the approach described in SFAS 123. However, SFAS 123(R) requires share-based payments to employees, including grants of employee stock options, to be recognized in the income statement based on their fair values at the date of grant. Pro forma disclosure is no longer an alternative.

On January 1, 2006, the Company adopted SFAS 123(R) using the modified prospective method as permitted under SFAS 123(R). Under this transition method, compensation cost recognized in the first quarter of 2006 includes compensation cost for all share-based payments granted prior to but not yet vested as of December 31, 2005, based on the grant-date fair value estimated in accordance with the provisions of SFAS 123. In accordance with the modified prospective method of adoption, the Company's results of operations and financial position for prior periods have not been restated.

The Company uses the Black-Scholes option pricing model to calculate the grant-date fair value of an award.

Liquidity and Capital Resources

During 2008, net cash used in operating activities was $1,248,318 and net cash provided by investing activities was $80,322, which was primarily for the assignment and sale of note receivable. Net cash provided by financing activities during 2008 was $776,770. At December 31, 2008, our cash and cash equivalents totaled $88,225, our assets totaled $374,565, our liabilities totaled $168,027, and we had stockholders' equity of $206,538.

During 2007, net cash used in operating activities was $1,434,681 and net cash used in investing activities was $182,384, which was primarily for patents and equipment. Net cash provided by financing activities during 2007 was $2,095,988. At December 31, 2007, our cash and cash equivalents totaled $479,451, our assets totaled $871,271, our liabilities totaled $218,091, and we had stockholders' equity of $653,180.

Sources and Uses of Cash

Our future expenditures and capital requirements will depend on numerous factors, including: the progress of our research and development efforts; the rate at which we can, directly or through arrangements with original equipment manufacturers, introduce and sell products incorporating our plastic materials technology; the costs of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights; market acceptance of our products and competing technological developments; and our ability to establish cooperative development, joint venture and licensing arrangements. We expect that we will incur in excess of $1,200,000 of expenditures over the next 12 months. Our cash requirements are expected to increase at a rate consistent with the Company s path to revenue growth as we expand our activities and operations with the objective of commercializing our electro-optic plastic technology during the latter portion of 2009.

Our business does not presently generate the cash needed to finance our current and anticipated operations. We believe we have raised sufficient capital to finance our operations through May 2009, however, we will need to obtain additional future financing after that time to finance our operations until such time that we can conduct profitable revenue-generating activities. Such future sources of financing may include cash from exercise of warrants, equity offerings, exercise of stock options and proceeds from debt instruments; but we cannot assure you that such equity or borrowings will be available or, if available, will be at rates or prices acceptable to us. If adequate funds are not available to satisfy either short-term or long-term capital requirements, or if planned revenues are not generated, we may be required to substantially limit our operations. This limitation of operations may include reductions in capital expenditures and reductions in staff and discretionary costs.

We expect that our cash used in operations will increase during 2009 and beyond as a result of the following planned activities:

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The addition of management, sales, marketing, technical and other staff to our workforce;

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Increased spending for the expansion of our research and development efforts, including purchases of additional laboratory and production equipment;

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