

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549

FORM 10-Q

(Mark One)

QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the quarterly period ended September 30, 2023

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from \_\_\_\_\_ to \_\_\_\_\_

Commission File Number 001-40766

**Lightwave Logic, Inc.**

(Exact name of registrant as specified in its charter)

**Nevada**

(State or other jurisdiction of incorporation or organization)

**82-0497368**

(I.R.S. Employer Identification No.)

**369 Inverness Parkway, Suite 350**

**Englewood, CO**

(Address of principal executive offices)

**80112**

(Zip Code)

**(720) 340-4949**

(Registrant's telephone number, including area code)

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

Title of each class

Common Stock, \$0.001 par value per share

Trading Symbol(s)

LWLG

Name of exchange on which registered

The NASDAQ Stock Market

Indicate by check mark whether the registrant (1) has filed all reports required 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  No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes  No

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

Large accelerated filer   
Non-accelerated filer

Accelerated filer   
Smaller reporting company   
Emerging growth company

If an emerging growth company, indicate by checkmark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

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

The number of shares of the registrant's common stock outstanding as of November 9, 2023 was 116,886,949.

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### Forward-Looking Statements

This report on Form 10-Q contains, and our officers and representatives may from time to time make, "forward-looking statements" within the meaning of the safe harbor provisions of the U.S. Private Securities Litigation Reform Act of 1995. Forward-looking statements can be identified by words such as: "anticipate," "intend," "plan," "goal," "seek," "believe," "project," "estimate," "expect," "continuing," "ongoing," "strategy," "future," "likely," "may," "should," "could," "will" and similar references to future periods. Examples of forward-looking statements include, among others, statements we make regarding expected operating results, such as anticipated revenue; anticipated levels of capital expenditures for our current fiscal year; our belief that we have, or will have, sufficient liquidity to fund our business operations during the next 12 months; strategy for gaining customers, growth, product development, market position, financial results and reserves.

Forward-looking statements are neither historical facts nor assurances of future performance. Instead, they are based only on our current beliefs, expectations, and assumptions regarding the future of our business, future plans and strategies, projections, anticipated events and trends, the economy and other future conditions. Because forward-looking statements relate to the future, they are subject to inherent uncertainties, risks and changes in circumstances that are difficult to predict and many of which are outside of our control. Our actual results and financial condition may differ materially from those indicated in the forward-looking statements. Therefore, you should not rely on any of these forward-looking statements. Important factors that could cause our actual results and financial condition to differ materially from those indicated in the forward-looking statements include, among others, the following: inability to generate significant revenue or to manage growth; lack of available funding; lack of a market for or market acceptance of our products; competition from third parties; general economic and business conditions; intellectual property rights of third parties; changes in the price of our stock and dilution; regulatory constraints and potential legal liability; ability to maintain effective internal controls; security breaches, cybersecurity attacks and other significant disruptions in our information technology systems; changes in technology and methods of marketing; delays in completing various engineering and manufacturing programs; changes in customer order patterns and qualification of new customers; changes in product mix; success in technological advances and delivering technological innovations; shortages in components; production delays due to performance quality issues with outsourced components; other risks to which our Company is subject; and other factors beyond the Company's control.

The ultimate correctness of these forward-looking statements depends upon a number of known and unknown risks and events. We discuss our known material risks under Part I Item 1.A "Risk Factors" contained in our Company's Annual Report on Form 10-K for the year ended December 31, 2022, and Part II, Item 1.A "Risk Factors" in this report on Form 10-Q. Many factors could cause our actual results to differ materially from the forward-looking statements. In addition, we cannot assess the impact of each factor on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements.

The forward-looking statements speak only as of the date on which they are made, and, except as required by law, we undertake no obligation to update any forward-looking statement to reflect events or circumstances after the date on which the statement is made or to reflect the occurrence of unanticipated events.

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### PART I – FINANCIAL INFORMATION

#### Item 1 Financial Statements

##### LIGHTWAVE LOGIC, INC.

##### FINANCIAL STATEMENTS

SEPTEMBER 30, 2023

(UNAUDITED)

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##### LIGHTWAVE LOGIC, INC. BALANCE SHEETS

ASSETS	September 30, 2023		December 31, 2022	
	(Unaudited)			
<b>CURRENT ASSETS</b>				
Cash and cash equivalents	\$ 30,876,646		\$ 24,102,151	
Prepaid expenses and other current assets	563,023		611,345	
Loan receivable	—		642,120	

	31,439,669	25,355,616
PROPERTY AND EQUIPMENT - NET	3,597,111	2,519,267
OTHER ASSETS		
Intangible assets - net	1,182,693	1,030,335
Operating Lease - Right of Use - Building	2,884,544	358,254
	4,067,237	1,388,589
TOTAL ASSETS	\$ 39,104,017	\$ 29,263,472
<b>LIABILITIES AND STOCKHOLDERS' EQUITY</b>		
CURRENT LIABILITIES		
Accounts payable	\$ 429,520	\$ 791,671
Accrued expenses	121,134	380,280
Accounts payable and accrued expenses - related parties	91,612	100,169
Deferred revenue	50,000	—
Deferred lease liability	41,778	41,778
Operating lease liability	138,434	190,125
	872,478	1,504,023
LONG TERM LIABILITIES		
Deferred lease liability	6,963	38,297
Operating lease liability	2,804,357	168,129
	2,811,320	206,426
TOTAL LIABILITIES	3,683,798	1,710,449
<b>STOCKHOLDERS' EQUITY</b>		
Preferred stock, \$0.001 par value, 1,000,000 authorized, No shares issued or outstanding	—	—
Common stock \$0.001 par value, 250,000,000 authorized, 116,683,977 and 112,882,793 issued and outstanding at September 30, 2023 and December 31, 2022	116,684	112,883
Additional paid-in-capital	158,731,989	134,406,825
Deferred compensation	(496,737)	(133,324)
Accumulated deficit	(122,931,717)	(106,833,361)
TOTAL STOCKHOLDERS' EQUITY	35,420,219	27,553,023
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	\$ 39,104,017	\$ 29,263,472

See accompanying notes to these financial statements.

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**LIGHTWAVE LOGIC, INC.**  
**STATEMENTS OF COMPREHENSIVE LOSS**  
**FOR THE THREE MONTHS AND NINE MONTHS ENDING SEPTEMBER 30, 2023 AND 2022**  
**(UNAUDITED)**

	For the Three Months Ending September 30, 2023	For the Three Months Ending September 30, 2022	For the Nine Months Ending September 30, 2023	For the Nine Months Ending September 30, 2022
NET SALES	\$ —	\$ —	\$ —	\$ —
COST AND EXPENSE				
Research and development	4,040,941	3,587,692	12,006,758	8,994,047
General and administrative	1,345,335	1,144,624	3,879,515	3,017,191
	<u>5,386,276</u>	<u>4,732,316</u>	<u>15,886,273</u>	<u>12,011,238</u>
LOSS FROM OPERATIONS	(5,386,276)	(4,732,316)	(15,886,273)	(12,011,238)
OTHER INCOME (EXPENSE)				
Interest income	246,987	29,125	403,960	57,545
Commitment fee	(25,302)	(73,170)	(607,728)	(181,027)
Other Expense	—	(27,022)	(8,315)	(27,022)
	<u>NET LOSS</u>	<u>\$ (5,164,591)</u>	<u>\$ (4,803,383)</u>	<u>\$ (16,098,356)</u>
				<u>\$ (12,161,742)</u>
LOSS PER SHARE				
Basic	\$ (0.04)	\$ (0.04)	\$ (0.14)	\$ (0.11)
Diluted	<u>\$ (0.04)</u>	<u>\$ (0.04)</u>	<u>\$ (0.14)</u>	<u>\$ (0.11)</u>
WEIGHTED AVERAGE NUMBER OF SHARES				
Basic	116,491,837	112,111,706	114,899,056	111,536,100
Diluted	<u>116,491,837</u>	<u>112,111,706</u>	<u>114,899,056</u>	<u>111,536,100</u>

See accompanying notes to these financial statements.

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**LIGHTWAVE LOGIC, INC.**  
**STATEMENT OF STOCKHOLDERS' EQUITY**  
**(UNAUDITED)**

**NINE-MONTH PERIOD ENDED SEPTEMBER 30, 2023**

	<u>Number of Shares</u>	<u>Common Stock</u>	<u>Additional Paid-in Capital</u>	<u>Deferred Compensation</u>	<u>Accumulated Deficit</u>	<u>Total</u>
BALANCE AT DECEMBER 31, 2022	112,882,793	\$ 112,883	\$ 134,406,825	\$ (133,324)	\$ (106,833,361)	\$ 27,553,023
Common stock issued to institutional investor	2,750,400	2,750	16,061,159	—	—	16,063,909
Common stock issued for commitment shares	99,407	100	607,628	—	—	607,728
Common stock sales at the market by investment banking company	172,115	172	1,378,302	—	—	1,378,474
Exercise of options	504,408	504	466,820	—	—	467,324
Exercise of warrants	169,000	169	164,581	—	—	164,750
Options issued for services	—	—	5,085,114	—	—	5,085,114
Restricted stock awards issued for future services	105,854	106	561,560	(561,666)	—	—
Deferred compensation	—	—	—	198,253	—	198,253
Net loss for the nine months ending September 30, 2023	—	—	—	—	(16,098,356)	(16,098,356)
<b>BALANCE AT SEPTEMBER 30, 2023 (UNAUDITED)</b>	<b>116,683,977</b>	<b>\$ 116,684</b>	<b>\$ 158,731,989</b>	<b>\$ (496,737)</b>	<b>\$ (122,931,717)</b>	<b>\$ 35,420,219</b>

**NINE-MONTH PERIOD ENDED SEPTEMBER 30, 2022**

	<u>Number of Shares</u>	<u>Common Stock</u>	<u>Additional Paid-in Capital</u>	<u>Deferred Compensation</u>	<u>Accumulated Deficit</u>	<u>Total</u>
BALANCE AT DECEMBER 31, 2021	110,555,459	\$ 110,556	\$ 114,696,597	\$ —	\$ (89,602,881)	\$ 25,204,272
Common stock issued to institutional investor	1,325,000	1,325	10,707,968	—	—	10,709,293
Common stock issued for commitment shares	19,672	19	181,008	—	—	181,027
Exercise of options	268,200	268	229,672	—	—	229,940
Cashless exercise of 4,375 options	2,596	3	35,015	—	—	35,018
Exercise of warrants	175,000	175	240,575	—	—	240,750
Options issued for services	—	—	4,288,172	—	—	4,288,172
Restricted stock awards issued for future services	28,500	29	274,995	(275,024)	—	—
Deferred compensation	—	—	—	67,467	—	67,467
Net loss for the nine months ending September 30, 2022	—	—	—	—	(12,161,742)	(12,161,742)
<b>BALANCE AT SEPTEMBER 30, 2022 (UNAUDITED)</b>	<b>112,374,427</b>	<b>\$ 112,375</b>	<b>\$ 130,654,002</b>	<b>\$ (207,557)</b>	<b>\$ (101,764,623)</b>	<b>\$ 28,794,197</b>

See accompanying notes to these financial statements.

**LIGHTWAVE LOGIC, INC.**  
**STATEMENT OF STOCKHOLDERS' EQUITY**  
**(UNAUDITED)**

**THREE-MONTH PERIOD ENDED SEPTEMBER 30, 2023**

	<u>Number of Shares</u>	<u>Common Stock</u>	<u>Additional Paid-in Capital</u>	<u>Deferred Compensation</u>	<u>Accumulated Deficit</u>	<u>Total</u>
BALANCE AT JUNE 30, 2023 (UNAUDITED)	116,184,724	\$ 116,185	\$ 154,946,488	\$ (519,466)	\$ (117,767,126)	\$ 36,776,081
Common stock issued to institutional investor	175,000	175	1,113,325	—	—	1,113,500
Common stock issued for commitment shares	3,777	4	25,298	—	—	25,302
Common stock sales at the market by investment banking company	97,115	97	734,848	—	—	734,945
Exercise of options	198,123	198	160,825	—	—	161,023
Exercise of warrants	19,000	19	14,231	—	—	14,250
Options issued for services	—	—	1,695,310	—	—	1,695,310
Restricted stock awards issued for future services	6,238	6	41,664	(41,670)	—	—
Deferred compensation	—	—	—	64,399	—	64,399
Net loss for the three months ending September 30, 2023	—	—	—	—	(5,164,591)	(5,164,591)
<b>BALANCE AT SEPTEMBER 30, 2023 (UNAUDITED)</b>	<b>116,683,977</b>	<b>\$ 116,684</b>	<b>\$ 158,731,989</b>	<b>\$ (496,737)</b>	<b>\$ (122,931,717)</b>	<b>\$ 35,420,219</b>

**THREE-MONTH PERIOD ENDED SEPTEMBER 30, 2022**

	<u>Number of Shares</u>	<u>Common Stock</u>	<u>Additional Paid-in Capital</u>	<u>Deferred Compensation</u>	<u>Accumulated Deficit</u>	<u>Total</u>
BALANCE AT JUNE 30, 2022 (UNAUDITED)	111,887,124	\$ 111,888	\$ 125,040,332	\$ (231,803)	\$ (96,961,240)	\$ 27,959,177
Common stock issued to institutional investor	450,000	450	4,003,150	—	—	4,003,600
Common stock issued for commitment shares	7,353	7	73,163	—	—	73,170
Exercise of options	29,950	30	47,735	—	—	47,765
Options issued for services	—	—	1,489,622	—	—	1,489,622
Deferred compensation	—	—	—	24,246	—	24,246

Net loss for the three months ending September 30, 2022	—	—	—	—	(4,803,383)	(4,803,383)
BALANCE AT SEPTEMBER 30, 2022 (UNAUDITED)	<u>112,374,427</u>	<u>\$ 112,375</u>	<u>\$ 130,654,002</u>	<u>\$ (207,557)</u>	<u>\$ (101,764,623)</u>	<u>\$ 28,794,197</u>

See accompanying notes to these financial statements.

LIGHTWAVE LOGIC, INC.  
STATEMENTS OF CASH FLOW  
(UNAUDITED)

	For the Nine Months Ending September 30, 2023	For the Nine Months Ending September 30, 2022
<b>CASH FLOWS FROM OPERATING ACTIVITIES</b>		
Net loss	\$ (16,098,356)	\$ (12,161,742)
Adjustments to reconcile net loss to net cash used in operating activities		
Stock options issued for services	5,085,114	4,288,172
Amortization of deferred compensation	198,253	67,467
Cashless option exercise	—	53,219
Common stock issued for services and fees	607,728	181,027
Depreciation and amortization of patents	797,500	758,285
Amortization of right of use asset	138,502	132,556
Loss on disposal of property and equipment	581	—
(Increase) decrease in assets		
Prepaid expenses and other current assets	87,058	(414,766)
(Decrease) increase in liabilities		
Accounts payable	(362,151)	367,048
Accrued expenses	(259,146)	(1,004,081)
Accounts payable and accrued expenses- related parties	(8,557)	131,368
Deferred revenue	50,000	—
Deferred lease liability	(31,334)	(31,334)
Operating lease liability	(118,990)	(132,556)
Net cash used in operating activities	<u>(9,913,798)</u>	<u>(7,765,337)</u>
<b>CASH FLOWS FROM INVESTING ACTIVITIES</b>		
Cost of intangibles	(215,061)	(47,705)
Purchase of property and equipment	(1,813,813)	(1,171,530)
Loan repayment	642,120	(588,180)
Sale of property and equipment	590	—
Net cash used in investing activities	<u>(1,386,164)</u>	<u>(1,807,415)</u>
<b>CASH FLOWS FROM FINANCING ACTIVITIES</b>		
Exercise of options and warrants	632,074	470,690
Cashless option exercise tax payments	—	(18,201)
Issuance of common stock, institutional investor	16,063,909	10,709,293
At the market sale by investment banking company	1,378,474	—
Net cash provided by financing activities	<u>18,074,457</u>	<u>11,161,782</u>
<b>NET INCREASE IN CASH AND CASH EQUIVALENTS</b>	<u>6,774,495</u>	<u>1,589,030</u>
<b>CASH AND CASH EQUIVALENTS - BEGINNING OF PERIOD</b>	<u>24,102,151</u>	<u>23,432,612</u>
<b>CASH AND CASH EQUIVALENTS - END OF PERIOD</b>	<u><u>\$ 30,876,646</u></u>	<u><u>\$ 25,021,642</u></u>
<b>Supplemental Disclosure of Non-cash investing and financing activities :</b>		
Amended Operating Lease - Right of Use - Building and Operating lease liability	\$ 2,703,527	\$ —

See accompanying notes to these financial statements.

LIGHTWAVE LOGIC, INC.  
NOTES TO FINANCIAL STATEMENTS  
SEPTEMBER 30, 2023 AND 2022

**NOTE 1- NATURE OF BUSINESS AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES**

**Financial Statements**

The accompanying unaudited financial statements have been prepared by Lightwave Logic, Inc. (the "Company"). These statements include all adjustments (consisting only of its normal recurring adjustments) which management believes necessary for a fair presentation of the statements and have been prepared on a consistent basis using the accounting policies described in the Summary of Significant Accounting Policies included in the financial statements and notes thereto included in the Company's Annual Report on Form 10-K for the year ended December 31, 2022, as filed with the Securities and Exchange Commission on March 1, 2023 (the "2022 Annual Report"). Certain financial information and footnote disclosures normally included in financial statements prepared in accordance with accounting principles generally accepted in the United States have been condensed or omitted pursuant to the rules and regulations of the Securities and Exchange Commission, although the Company firmly believes that the accompanying disclosures are adequate to make the information presented not misleading. The financial statements should be read in conjunction with the financial statements and notes thereto included in the 2022 Annual Report. The interim operating results for the three and nine months ending September 30, 2023 may not be indicative of operating results expected for the full year.

## Nature of Business

Lightwave Logic, Inc. is a technology company focused on the development of next generation photonic devices and electro-optic polymer materials systems for applications in high speed fiber-optic data communications, telecommunications and optical computing markets. The Company's first revenue stream is from a technology material supply and licensing agreement that incorporates the Company's patented electro-optic polymer materials for use in manufacturing photonic devices. Currently the Company is in various stages of photonic device and materials development and evaluation with potential customers and strategic partners. The Company expects to obtain additional revenue from material supply and licensing agreements, technology transfer agreements and the production and direct sale of its own photonic devices.

The Company's current development activities are subject to significant risks and uncertainties, including failing to secure additional funding to operationalize the Company's technology now under development.

## Revenue Recognition

In accordance with FASB ASC 606, Revenue from Contracts with Customers, the Company recognizes revenue upon transfer of promised goods or services in an amount that reflects the consideration expected to be received in exchange for those goods or services. To determine revenue recognition for arrangements within the scope of FASB ASC 606, the Company performs the following five steps:

1. Identify the contract with the customer.
2. Identify the performance obligations in the contract.
3. Determine the transaction price.
4. Allocate the transaction price to the performance obligations in the contract.
5. Recognize revenue as (or when) the performance obligations are satisfied.

## NOTE 1- NATURE OF BUSINESS AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

### Revenue Recognition (Continued)

For product sales, revenue will be recognized at a point in time when the product is shipped or is delivered to the customer's location. For services performed, revenue will be recognized at a point in time when the service is performed. However, for certain contracts, revenue will be recognized over time as the customer simultaneously receives and consumes the benefits of performance as the Company performs the service. For license agreements, each contract is reviewed to determine the portion of the revenue recognition at the point in time that the license is transferred to the customer and the portion of the revenue recognition to be recognized over time.

### Stock-based Payments

The Company accounts for stock-based compensation under the provisions of Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC) 718, "Compensation - Stock Compensation", which requires the measurement and recognition of compensation expense for all stock-based awards made to employees and directors based on estimated fair values on the grant date. The fair value of restricted stock awards is estimated by the market price of the Company's common stock at the date of grant. Restricted stock awards are being amortized to expense over the vesting period. The Company estimates the fair value of option and warrant awards on the date of grant using the Black-Scholes model. The value of the portion of the award that is ultimately expected to vest is recognized as expense over the requisite service periods using the straight-line method. In June 2018, the FASB issued ASU No. 2018-07, *Compensation – Stock Compensation (Topic 718), Improvements to Nonemployee Share-Based Payment Accounting* (the "2018 Update"). The amendments in the 2018 Update expand the scope of Topic 718 to include share-based payment transactions for acquiring goods and services from nonemployees. Prior to the 2018 Update, Topic 718 applied only to share-based transactions to employees. Consistent with the accounting requirement for employee share-based payment awards, nonemployee share-based payment awards within the scope of Topic 718 are measured at grant-date fair value of the equity instruments that an entity is obligated to issue when the good has been delivered or the service has been rendered and any other conditions necessary to earn the right to benefit from the instruments have been satisfied.

The Company has elected to account for forfeiture of stock-based awards as they occur.

## NOTE 1- NATURE OF BUSINESS AND SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (CONTINUED)

### Loss Per Share

The Company follows FASB ASC 260, "Earnings per Share", resulting in the presentation of basic and diluted earnings per share. Because the Company reported a net loss in 2023 and 2022, common stock equivalents, including stock options and warrants were anti-dilutive; therefore, the amounts reported for basic and dilutive loss per share were the same.

### Comprehensive Income

The Company follows FASB ASC 220.10, "Reporting Comprehensive Income (Loss)." Comprehensive income (loss) is a more inclusive financial reporting methodology that includes disclosure of certain financial information that historically has not been recognized in the calculation of net income (loss). Since the Company has no items of other comprehensive income (loss), comprehensive income (loss) is equal to net income (loss).

### Recently Issued Accounting Pronouncements Not Yet Adopted

As of September 30, 2023, there are no recently issued accounting standards not yet adopted which would have a material effect on the Company's financial statements.

### Recently Adopted Accounting Pronouncements

As of September 30, 2023 and for the period then ended, there are no recently adopted accounting standards that have a material effect on the Company's financial statements.

### Reclassifications

Certain reclassifications have been made to the 2022 financial statement in order to conform to the 2023 financial statement presentation.

## NOTE 2 – MANAGEMENT'S PLANS

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 polymer 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 approximately \$1,750,000 of expenditures per month over the next 12 months. Our current cash position enables us to finance our operations through April 2025. On February 28, 2023, the Company entered into a purchase agreement with the institutional investor to sell up to \$30,000,000 of common stock over a 36-month period (described in Note 10). Pursuant to the purchase agreement, the Company received \$876,250 in October and November 2023 and a remaining available amount of \$ 16,907,148 is available to the Company per the agreement. On December 9, 2022, the Company entered into a sales agreement with an investment banking company whereby the Company may offer and sell shares of its common stock having an aggregate offering price of up to \$35,000,000 from time to time through or to the investment banking company, as sales agent or principal (described in Note 10). There were no sales of shares of the Company's common stock pursuant to the sales agreement in October and November 2023. The remaining available amount of \$33,578,860 is available to the Company per the agreement. The Company's first commercial agreement occurred in May 2023 from a material supply and license agreement that incorporates the Company's patented electro-optic polymer materials for use in manufacturing photonic devices (described in Note 3). During October 2023, the licensee requisitioned material under this agreement. Our cash requirements are expected to increase at a rate consistent with the Company's path to full commercialization as we expand our activities and operations. We currently have no debt to service.

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LIGHTWAVE LOGIC, INC.  
NOTES TO FINANCIAL STATEMENTS  
SEPTEMBER 30, 2023 AND 2022

## NOTE 3 – REVENUE

The Company's first commercial agreement occurred in May 2023, the form of a (4) year material supply and license agreement (the "License Agreement") that incorporates the Company's patented electro-optic polymer materials for use in manufacturing photonic devices (the "Licensed Product"). The licensee shall pay the Company a running royalty with a minimum royalty paid on an annual basis over the term of the License Agreement. Additional future revenue will be generated from royalties from the licensee's sale of Licensed Product that exceed the minimum royalty payments. The License Agreement is a non-exclusive material supply and license agreement.

### Timing of Revenue Recognition and Contract Balances

All revenues are recognized over time commencing with the License Agreement in May 2023. No revenues were recognized for the three and nine month period ending September 30, 2023 since the licensee did not requisition material as of September 30, 2023. An up-front licensing fee in the amount of \$50,000 was paid during the nine month period ending September 30, 2023 and is recorded in short term liability deferred revenue in the Company's balance sheet as of September 30, 2023.

Contract balances are as follows:

	September 30, 2023	December 31, 2022
Accounts receivable, net	\$ —	\$ —
Short-term contract assets	\$ —	\$ —
Long-term contract assets	\$ —	\$ —
Short-term liability deferred revenue	\$ 50,000	\$ —
Long-term liability deferred revenue	\$ —	\$ —

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LIGHTWAVE LOGIC, INC.  
NOTES TO FINANCIAL STATEMENTS  
SEPTEMBER 30, 2023 AND 2022

## NOTE 3 – REVENUE (CONTINUED)

### Assets Recognized for the Costs to Obtain a Contract

There are no assets recognized for the costs to obtain the License Agreement.

## NOTE 4 – LOAN RECEIVABLE

On September 7, 2022, the Company entered into a convertible loan agreement (the "Loan") with an entity and issued a loan on September 12, 2022 in the amount of EUR 600,000 bearing interest at 7% per annum with a maturity date of March 31, 2023. The loan and interest were repaid in February and March 2023. The Company recorded \$0 and \$11,125 of interest income for the three and nine months ended September 30, 2023 and used the average exchange rate for the conversion of the EUR denominated interest income for the period.

## NOTE 5 – PREPAID EXPENSES AND OTHER CURRENT ASSETS

Prepaid expenses and other current assets consist of the following:

	September 30, 2023	December 31, 2022
Insurance	\$ 316,315	\$ 218,767
License	79,357	94,195
Prototype devices	40,473	40,473
Lease incentive receivable	38,736	—
Rent	36,525	36,525
Investor relations	33,433	18,250
Other	18,184	45,675
Legal	—	83,941
Deposit for equipment	—	59,850
Loan interest receivable	—	13,669

\$	563,023	\$	611,345
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#### NOTE 6 – PROPERTY AND EQUIPMENT

Property and equipment consist of the following:

	September 30, 2023	December 31, 2022
Office equipment	\$ 136,734	\$ 119,404
Lab equipment	7,852,126	6,234,777
Furniture	74,119	33,128
Leasehold Improvements	321,815	184,843
	8,384,794	6,572,152
Less: Accumulated depreciation	4,787,683	4,052,885
	\$ 3,597,111	\$ 2,519,267

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LIGHTWAVE LOGIC, INC.  
NOTES TO FINANCIAL STATEMENTS  
SEPTEMBER 30, 2023 AND 2022

#### NOTE 6 – PROPERTY AND EQUIPMENT (CONTINUED)

Depreciation expense for the nine months ending September 30, 2023 and 2022 was \$ 734,798 and \$699,423. Depreciation expense for the three months ending September 30, 2023 and 2022 was \$242,454 and \$246,507. During the nine months ending September 30, 2023, the Company sold equipment for proceeds of \$ 590 and a loss of \$581. During the three and nine months ending September 30, 2022, the Company retired \$ 70,963 of leasehold improvements.

#### NOTE 7 – INTANGIBLE ASSETS

This represents legal fees and patent fees associated with the prosecution of patent applications. The Company has recorded amortization expense on patents granted, which are amortized over the remaining legal life. Maintenance patent fees are paid to a government patent authority to maintain a granted patent in force. Some countries require the payment of maintenance fees for pending patent applications. Maintenance fees paid after a patent is granted are expensed, as these are considered ongoing costs to "maintain a patent". Maintenance fees paid prior to a patent grant date are capitalized to patent costs, as these are considered "patent application costs". No amortization expense has been recorded on the remaining patent applications since patents on these applications have yet to be granted.

Patents consist of the following:

	September 30, 2023	December 31, 2022
Patents	\$ 1,821,124	\$ 1,606,064
Less: Accumulated amortization	638,431	575,729
	\$ 1,182,693	\$ 1,030,335

Amortization expense for the nine months ending September 30, 2023 and 2022 was \$ 62,703 and \$58,862. Amortization expense for the three months ending September 30, 2023 and 2022 was \$24,000 and \$15,229. There were no patent costs written off for the three and nine months ending September 30, 2023 and 2022.

#### NOTE 8 – LEASES

On October 30, 2017, the Company entered into a lease agreement to lease approximately 13,420 square feet of office, chemistry, clean room and research and development space located in Colorado for the Company's principal executive offices and research and development facility. The term of the lease was sixty one (61) months, beginning on November 1, 2017 and ending on November 30, 2022. During January 2022, the term was extended for an additional twenty-four (24) months. Base rent for the first year of the lease term is approximately \$168,824, with an increase in annual base rent of approximately 3% in each subsequent year of the lease term. As specified in the lease, the Company paid the landlord (i) all base rent for the period November 1, 2017 and ending on October 31, 2019, in the sum of \$347,045; and (ii) the estimated amount of tenant's proportionate share of operating expenses for the same period in the sum of \$ 186,293. Commencing on November 1, 2019, monthly installments of base rent and one-twelfth of landlord's estimate of tenant's proportionate share of annual operating expenses shall be due on the first day of each calendar month. The lease also provides that (i) on November 1, 2019 landlord shall pay the Company for the cost of the cosmetic improvements in the amount of \$3.00 per rentable square foot of the premises, and (ii) on or prior to November 1, 2019, the Company shall deposit with Landlord the sum of \$36,525 as a security deposit which shall be held by landlord to secure the Company's obligations under the lease. On October 30, 2017, the Company entered into an agreement with the tenant leasing the premise from the landlord ("Original Lessee") whereby the Original Lessee agreed to pay the Company the sum of \$260,000 in consideration of the Company entering into the lease and landlord agreeing to the early termination of the Original Lessee's lease agreement with landlord. The consideration of \$260,000 was received on November 1, 2017.

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LIGHTWAVE LOGIC, INC.  
NOTES TO FINANCIAL STATEMENTS  
SEPTEMBER 30, 2023 AND 2022

#### NOTE 8 – LEASES (CONTINUED)

Due to the adoption of the new lease standard, the Company has capitalized the present value of the minimum lease payments commencing November 1, 2019, including the additional option period using an estimated incremental borrowing rate of 6.5%. The minimum lease payments do not include common area annual expenses which are considered to be non-lease components.

As of January 1, 2019 the operating lease right-of-use asset and operating lease liability amounted to \$ 885,094 with no cumulative-effect adjustment to the opening balance of retained earnings/accumulated deficit.

On November 22, 2022, the Company entered into an amendment to the Lease ("the Amended Lease") to lease an additional approximately 9,684 square feet of adjacent office and warehouse space. The term of the Amended Lease is one hundred twenty (128) months, with an effective date of June 1, 2023. Base rent through January 31, 2024 of the Amended Lease term is approximately \$30,517 per month. The base rent for the next full year of the Amended Lease term is approximately

\$377,288, with an increase in annual base rent of approximately 3% in each subsequent year of the lease term. Commencing on June 1, 2023, monthly installments of base rent and one-twelfth of landlord's estimate of tenant's proportionate share of annual operating expenses shall be due on the first day of each calendar month. The Amended Lease also provides an allowance of up to \$38,736 to be used solely for the cost of renovations to the additional lease premises. As of June 1, 2023, the operating lease right-of-use asset and operating lease liability amounted to \$2,945,322.

The Company has elected not to recognize right-of-use assets and lease liabilities arising from short-term leases. There are no other material operating leases.

The Company is obligated under the Amended Lease for office, chemistry, clean room and research and development space. The aggregate minimum future lease payments under the Amended Lease, including the extended term are as follows:

YEARS ENDING DECEMBER 31,	AMOUNT
2023	\$ 91,550
2024	376,364
2025	387,666
2026	399,199
2027	411,174
Thereafter	2,781,183
	4,447,136
Less discounted interest	(1,504,345)
<b>TOTAL</b>	<b>\$ 2,942,791</b>

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LIGHTWAVE LOGIC, INC.  
NOTES TO FINANCIAL STATEMENTS  
SEPTEMBER 30, 2023 AND 2022

**NOTE 8 – LEASES (CONTINUED)**

Rent expense amounting to \$160,660 and \$53,553 is included in research and development and general and administrative expenses for the nine months ended September 30, 2023. Rent expense amounting to \$103,796 and \$34,599 is included in research and development and general and administrative expenses for the nine months ended September 30, 2022. Rent expense amounting to \$85,104 and \$28,368 is included in research and development and general and administrative expenses for the three months ended September 30, 2023. Rent expense amounting to \$34,599 and \$11,533 is included in research and development and general and administrative expenses for the three months ended September 30, 2022.

**NOTE 9 – INCOME TAXES**

There is no income tax benefit for the losses for the nine months ended September 30, 2023 and 2022 since management has determined that the realization of the net deferred tax asset is not assured and has created a valuation allowance for the entire amount of such benefits.

The Company's policy is to record interest and penalties associated with unrecognized tax benefits as additional income taxes in the statement of operations. As of January 1, 2023, the Company had no unrecognized tax benefits, or any tax related interest or penalties. There were no changes in the Company's unrecognized tax benefits during the period ended September 30, 2023. The Company did not recognize any interest or penalties during 2022 related to unrecognized tax benefits. With few exceptions, the U.S. and state income tax returns filed for the tax years ending on December 31, 2019 and thereafter are subject to examination by the relevant taxing authorities.

**NOTE 10 – STOCKHOLDERS' EQUITY**

**Preferred Stock**

Pursuant to the Company's Articles of Incorporation, the Company's board of directors is empowered, without stockholder approval, to issue series of preferred stock with any designations, rights and preferences as they may from time to time determine. The rights and preferences of this preferred stock may be superior to the rights and preferences of the Company's common stock; consequently, preferred stock, if issued could have dividend, liquidation, conversion, voting or other rights that could adversely affect the voting power or other rights of the common stock. Additionally, preferred stock, if issued, could be utilized, under special circumstances, as a method of discouraging, delaying or preventing a change in control of the Company's business or a takeover from a third party.

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LIGHTWAVE LOGIC, INC.  
NOTES TO FINANCIAL STATEMENTS  
SEPTEMBER 30, 2023 AND 2022

**NOTE 10 – STOCKHOLDERS' EQUITY (CONTINUED)**

**Common Stock Options and Warrants**

In January 2019, the Company signed a purchase agreement with the institutional investor to sell up to \$ 25,000,000 of common stock. The Company registered 9,500,000 shares pursuant to a registration statement filed on January 30, 2019 which became effective February 13, 2019. The Company issued 350,000 shares of common stock to the institutional investor as an initial commitment fee valued at \$258,125, fair value, and 812,500 shares of common stock are reserved for additional commitment fees to the institutional investor in accordance with the terms of the purchase agreement. The Company registered an additional 6,000,000 shares pursuant to a registration statement filed on January 24, 2020 which became effective February 4, 2020. The Company registered an additional 8,000,000 shares pursuant to a registration statement filed on November 20, 2020 which became effective November 20, 2020. During the period January 2019 through September 30, 2022 the institutional investor purchased 22,337,500 shares of common stock for proceeds of \$23,773,924 and the Company issued 772,666 shares of common stock as additional commitment fee, valued at \$1,575,509, fair value, leaving 39,834 in reserve for additional commitment fees. During the three and nine month periods ending September 30, 2023, the institutional investor did not purchase any shares of common stock. All the registered shares under the purchase agreement have been issued as of September 30, 2023.

On July 2, 2021, the Company filed a \$100,000,000 universal shelf registration statement with the U.S. Securities and Exchange Commission which became effective on July 9, 2021.

On October 4, 2021, the Company entered into a purchase agreement with the institutional investor to sell up to \$ 33,000,000 of common stock over a 36-month period. Concurrently with entering into the purchase agreement, the Company also entered into a registration rights agreement which provides the institutional investor with certain registration rights related to the shares issued under the purchase agreement. Pursuant to the purchase agreement, the Company issued 30,312 shares of

common stock to the institutional investor as an initial commitment fee valued at \$279,174, fair value, and 60,623 shares of common stock are reserved for additional commitment fees to the institutional investor in accordance with the terms of the purchase agreement. During the period October 4, 2021 through September 30, 2023, the institutional investor purchased 3,632,456 shares of common stock for proceeds of \$33,000,000 and the Company issued 60,623 shares of common stock as additional commitment fee, valued at \$694,531, fair value. During the nine month period ending September 30, 2023, pursuant to the purchase agreement, the institutional investor purchased 779,945 shares of common stock for proceeds of \$3,847,307 and the Company issued 7,069 shares of common stock as additional commitment fee, valued at \$38,161, fair value. During the three month period ending September 30, 2023, the Company did not issue any shares pursuant to this purchase agreement. All of the registered shares under the purchase agreement have been issued as of September 30, 2023.

LIGHTWAVE LOGIC, INC.  
NOTES TO FINANCIAL STATEMENTS  
SEPTEMBER 30, 2023 AND 2022

**NOTE 10 – STOCKHOLDERS' EQUITY (CONTINUED)**

**Common Stock Options and Warrants (Continued)**

On February 28, 2023, the Company entered into a purchase agreement with an institutional investor to sell up to \$ 30,000,000 of common stock over a 36-month period. Concurrently with entering into the purchase agreement, the Company also entered into a registration rights agreement which provides the institutional investor with certain registration rights related to the shares issued under the purchase agreement. Pursuant to the purchase agreement, the Company issued 50,891 shares of common stock to the institutional investor as an initial commitment fee valued at \$279,391, fair value, and 101,781 shares of common stock are reserved for additional commitment fees to the institutional investor in accordance with the terms of the purchase agreement. During the period February 28, 2023 through September 30, 2023, the institutional investor purchased 1,970,455 shares of common stock for proceeds of \$12,216,602 and the Company issued 41,447 shares of common stock as additional commitment fee, valued at \$290,176, fair value. During the three month period ending September 30, 2023, pursuant to the purchase agreement, the institutional investor purchased 175,000 shares of common stock for proceeds of \$1,113,500 and the Company issued 3,777 shares of common stock as additional commitment fee, valued at \$25,302 fair value. During October and November 2023, pursuant to the purchase agreement, the institutional investor purchased 200,000 shares of common stock for proceeds of \$876,250 and the Company issued 2,972 shares of common stock as additional commitment fee, valued at \$ 14,221, fair value, leaving 57,362 in reserve for additional commitment fees.

On December 9, 2022, the Company entered into a sales agreement with an investment banking company. In accordance with the terms of this sales agreement, the Company may offer and sell shares of its common stock having an aggregate offering price of up to \$35,000,000 from time to time through or to the investment banking company, as sales agent or principal. Sales of shares of the Company's common stock, if any, may be made by any method deemed to be an "at the market offering". The sales agent is entitled to compensation under the terms of the sales agreement at a commission rate equal to 3% of the gross proceeds of the sales price of common stock that they sell. During the nine month period ending September 30, 2023, pursuant to the sales agreement, the investment banking company sold 172,115 shares of the Company's common stock for proceeds of \$1,378,474 after a payment of the commission in the amount of \$42,634 to the investment banking company. During the three month period ending September 30, 2023, pursuant to the sales agreement, the investment banking company sold 97,115 shares of the Company's common stock for proceeds of \$734,945 after a payment of the commission in the amount of \$22,731 to the investment banking company. During October and November 2023, pursuant to the sales agreement, the investment banking company did not sell any shares of the Company's common stock.

**Restricted Stock Awards**

On March 16, 2023, the Compensation Committee of the Board of Directors approved grants totaling 99,616 Restricted Stock Awards to the Company's four outside directors. Each RSA had a grant date fair value of \$5.22 which shall be amortized on a straight-line basis over the vesting period into director's compensation expenses within the Consolidated Statement of Comprehensive Loss. Such RSAs were granted under the 2016 Equity Incentive Plan ("2016 Plan") and vest in total 8,338 shares on March 16, 2023, with the remaining vesting in 33 equal monthly installments in total of 2,766 shares beginning April 1, 2023.

On August 1, 2023, the Compensation Committee of the Board of Directors approved a grant totaling 6,238 Restricted Stock Awards to the Company's outside director. The new RSA had a grant date fair value of \$6.68 which shall be amortized on a straight-line basis over the vesting period into director's compensation expenses within the Consolidated Statement of Comprehensive Loss. Such RSA was granted under the 2016 Equity Incentive Plan ("2016 Plan"). 218 shares from this grant vested on August 1, with the remaining vesting in 28 equal monthly installments in total of 215 shares beginning September 1, 2023.

Upon the occurrence of a Change in Control, 100% of the unvested Restricted Stock shall vest as of the date of the Change in Control. Upon vesting, the restrictions on the shares lapse.

LIGHTWAVE LOGIC, INC.  
NOTES TO FINANCIAL STATEMENTS  
SEPTEMBER 30, 2023 AND 2022

**NOTE 11 – STOCK BASED COMPENSATION**

During 2007, the Board of Directors of the Company adopted the 2007 Employee Stock Plan ("2007 Plan") that was approved by the shareholders. Under the 2007 Plan, the Company is authorized to grant options to purchase up to 10,000,000 shares of common stock to directors, officers, employees and consultants who provide services to the Company. The 2007 Plan is intended to permit stock options granted to employees under the 2007 Plan to qualify as incentive stock options under Section 422 of the Internal Revenue Code of 1986, as amended ("Incentive Stock Options"). All options granted under the 2007 Plan, which are not intended to qualify as Incentive Stock Options are deemed to be non-qualified options ("Non-Statutory Stock Options").

Effective June 24, 2016, the 2007 Plan was terminated. As of September 30, 2023, options to purchase 2,473,000 shares of common stock have been issued and are outstanding.

During 2016, the Board of Directors of the Company adopted the 2016 Plan that was approved by the shareholders at the 2016 annual meeting of shareholders on May 20, 2016. Under the 2016 Plan, the Company is authorized to grant awards of incentive and non-qualified stock options and restricted stock to purchase up to 3,000,000 shares of common stock to employees, directors and consultants. Effective May 16, 2019, the number of shares of the Company's common stock available for issuance under the 2016 Plan was increased from 3,000,000 to 8,000,000 shares. Effective May 25, 2023, the number of shares of the Company's common stock available for issuance under the 2016 Plan was increased from 8,000,000 to 13,000,000 shares and awards of restricted stock units are authorized for issuance. As of September 30, 2023, options to purchase 6,022,307 shares of common stock have been issued and are outstanding. 129,174 restricted shares of common stock have been awarded under the 2016 Plan. As of September 30, 2023, 5,497,284 shares of common stock remain available for grants under the 2016 Plan.

Both plans are administered by the Company's Board of Directors or its compensation committee which determines the persons to whom awards will be granted, the number of awards to be granted, and the specific terms of each grant. Subject to the provisions regarding Ten Percent Shareholders, (as defined in the 2016 Plan), the exercise price per share of each option cannot be less than 100% of the fair market value of a share of common stock on the date of grant. Options granted under the 2016 Plan are generally exercisable for a period of 10 years from the date of grant and may vest on the grant date, another specified date or over a period of time.

The Company uses the Black-Scholes option pricing model to calculate the grant-date fair value of an award, with the following assumptions for 2023: no dividend yield in all years, expected volatility, based on the Company's historical volatility, 73.7% to 77.2%, risk-free interest rate between 3.37% to 4.27% and expected option life of 10 years. Prior to May 2018, the expected life is based on the estimated average of the life of options using the "simplified" method, as prescribed in FASB ASC 718, due to insufficient historical exercise activity during recent years. Starting in May 2018, the expected life is based on the legal contractual life of options.

As of September 30, 2023, there was \$ 3,866,879 of unrecognized compensation expense related to non-vested market-based share awards that is expected to be recognized through September 2026.

LIGHTWAVE LOGIC, INC.  
NOTES TO FINANCIAL STATEMENTS  
SEPTEMBER 30, 2023 AND 2022

**NOTE 11 – STOCK BASED COMPENSATION (CONTINUED)**

Share-based compensation was recognized as follows:

	For the Nine Months Ending September 30, 2023	For the Nine Months Ending September 30, 2022
2007 Employee Stock Option Plan	\$ —	\$ —
2016 Equity Incentive Plan	5,085,114	4,288,172
2016 Equity Incentive Plan restricted stock awards	198,253	67,467
Warrants	—	—
<b>Total share-based compensation</b>	<b>\$ 5,283,367</b>	<b>\$ 4,355,639</b>

The following tables summarize all stock option and warrant activity of the Company during the nine months ended September 30, 2023:

	Number of Shares	Exercise Price	Weighted Average Exercise Price
Outstanding, December 31, 2022	8,073,173	\$0.51 - \$16.81	\$ 1.91
Granted	1,751,667	\$4.28 - \$7.67	\$ 5.29
Forfeited	(37,125)	\$6.25 - \$8.93	\$ 7.13
Exercised	(673,408)	\$0.67 - \$5.22	\$ 0.94
<b>Outstanding, September 30, 2023</b>	<b>9,114,307</b>	<b>\$0.51 - \$16.81</b>	<b>\$ 2.61</b>
<b>Exercisable, September 30, 2023</b>	<b>8,113,938</b>	<b>\$0.51 - \$16.81</b>	<b>\$ 2.24</b>

The aggregate intrinsic value of options and warrants outstanding and exercisable as of September 30, 2023 was \$ 23,062,130. The aggregate intrinsic value is calculated as the difference between the exercise price of the underlying options and warrants and the closing stock price of \$4.47 for the Company's common stock on September 30, 2023. During the nine month period ending September 30, 2023, 504,408 options were exercised for proceeds of \$ 467,324. During the nine month period ending September 30, 2023, 169,000 warrants were exercised for proceeds of \$ 164,750.

<b>Non-Qualified Stock Options and Warrants Outstanding</b>			
<b>Range of Exercise Prices</b>	<b>Number Outstanding Currently Exercisable at September 30, 2023</b>	<b>Weighted Average Remaining Contractual Life</b>	<b>Weighted Average Exercise Price of Options and Warrants Currently Exercisable</b>
\$0.51 - \$16.81	8,113,938	5.28 Years	\$ 2.24

LIGHTWAVE LOGIC, INC.  
NOTES TO FINANCIAL STATEMENTS  
SEPTEMBER 30, 2023 AND 2022

**NOTE 11 – STOCK BASED COMPENSATION (CONTINUED)**

The fair value of restricted stock awards is estimated by the market price of the Company's common stock at the date of grant. Restricted stock activity during the nine month period ending September 30, 2023 is as follows:

	<b>Restricted Stock Awards Nine month period ended September 30, 2023</b>	
	<b>Number of Shares</b>	<b>Weighted Average Fair Value per Share</b>
Non-vested, beginning of period	13,816	\$ 9.65
Granted	105,854	5.31
Vested	(25,367)	5.24
Cancelled and forfeited	—	—
<b>Non-vested, end of period</b>	<b>94,303</b>	<b>\$ 5.96</b>

Restricted stock awards are being amortized to expense over the vesting period. As of September 30, 2023 and 2022, the unamortized value of the restricted stock awards was \$496,736 and \$0, respectively.

**NOTE 12 – RELATED PARTY**

At September 30, 2023 the Company had a legal accrual to related party of \$ 99,500, travel and office expense accrual of officers in the amount of \$ 10,550, accounting service fee accrual and expense reimbursements to related parties of \$7,962 offset by prepaid director operations committee fees in the amount of \$ 26,400. At

December 31, 2022 the Company had a legal accrual to a related party of \$60,577, fees and consulting expense accruals of advisory board members in the amount of \$18,000, fees to directors in the amount of \$ 13,500, travel and office expense accruals of officers in the amount of \$ 4,859 and accounting service fee accrual and expense reimbursement to related parties of \$3,233.

#### **NOTE 13 – RETIREMENT PLAN**

The Company established a 401(k) retirement plan covering all eligible employees beginning November 15, 2013. For the nine months ending September 30, 2023 and 2022, a contribution of \$51,413 and \$40,585 was charged to expense for all eligible non-executive participants. For the three months ending September 30, 2023 and 2022, a contribution of \$18,554 and \$13,498 was charged to expense for all eligible non-executive participants.

#### **NOTE 14 – SUBSEQUENT EVENTS**

During October 2023, the licensee requisitioned material under the material supply and license agreement that incorporates the Company's patented electro-optic polymer materials for use in manufacturing photonic devices.

#### **Item 2 Management's Discussion and Analysis of Financial Condition and Results of Operations**

*The following discussion and analysis should be read in conjunction with our financial statements, included herewith. This discussion should not be construed to imply that the results discussed herein will necessarily continue into the future, or that any conclusion reached herein will necessarily be indicative of actual operating results in the future. Such discussion represents only the best present assessment of our management. This information should also be read in conjunction with our audited historical financial statements which are included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2022, filed with the Securities and Exchange Commission on March 1, 2023.*

##### **Overview**

Lightwave Logic, Inc. is a technology company focused on the development of next generation electro-optic photonic devices made on its P<sup>2</sup>IC™ technology platform which we have detailed as: 1) Polymer Stack™, 2) Polymer Plus™, and 3) Polymer Slot™. Our unique polymer technology platform uses in-house proprietary high-activity and high-stability organic polymers. Electro-optical devices called modulators convert data from electric signals into optical signals for multiple applications.

Our differentiation at the modulator device level is in higher speed, lower power consumption, simplicity of manufacturing, small footprint (size), and reliability. We have demonstrated higher speed and lower power consumption in packaged devices, and during 2022 and 2023, we continued to make advances in techniques to translate material properties to efficient, reliable modulator devices with commercial foundries. We are currently focused on testing and demonstrating the simplicity of manufacturability and reliability of our devices, including in conjunction with the silicon photonics manufacturing ecosystem. In 2022 we discussed the addition of several silicon-based foundry partners to help scale in volume our polymer modulator devices and we started to receive working modulator chips from the foundries. We have advanced our interactions with our foundries and we continue to receive working modulator chips for prototyping. Silicon-based foundries are large semiconductor fabrication plants developed for the electronics IC business, that are now engaging with silicon photonics to increase their wafer throughput. Partnering with silicon-based foundries not only demonstrates that our polymer technology can be transferred into standard production lines using standard equipment, it also allows us to efficiently utilize our capital. The foundry partnerships will allow us to scale our high-performance polymer optical engines quickly and efficiently.

Our extremely strong and broad patent portfolio allows us to optimize our business model in three areas: 1) Traditional focus on product development, 2) Patent licensing and 3) Technology transfer to foundries. We are continually looking to strengthen our patent portfolio both by internal inventions and acquisition of intellectual property.

We are initially targeting applications in fiber optic data communications and telecommunications markets and are exploring other applications that include automotive/LIDAR, sensing, displays etc., for our polymer technology platform. Our goal is to have our unique polymer technology platform become ubiquitous.

Artificial Intelligence (AI) has been integrating deeper within our daily activities with applications to make us more efficient and possibly smarter. The impact on the internet is huge, and the internet is based on an optical network that utilizes data centers to route and switch traffic or information to and from destinations. Data centers are being upgraded today in a fashion that the industry has not seen before. The expected demands of increased traffic, information, and data driven by AI is changing the way the internet is being operated. AI is now creating new and interesting market opportunities to upgrade the internet. Three of these are important today: density, speed, and low power and these are very well aligned with our high performance electro-optic polymers. We are designing high performance polymer modulator optical engines to support the rise and growth of AI as it generates more information that will travel through the internet and optical network.

##### **Commencement of Commercial Operations**

We commenced commercial operations in May 2023. Presently, our commercial operations consist of a material supply license agreement to provide Perkinamine® chromophore materials for polymer based photonic devices and photonic integrated circuits (PICs). The license agreement represents tangible commercial progress for electro-optic polymers as part of our Company's business plan. Our Company is also in various stages of photonic device and materials development and evaluation with potential customers and strategic partners. We expect to obtain additional revenue from material supply and licensing agreements, technology transfer agreements and the production and direct sale of our own photonic devices.

##### **Materials Development**

Our Company designs and synthesizes organic chromophores for use in its own proprietary electro-optic polymer systems and photonic device designs. A polymer system is not solely a material, but also encompasses various technical enhancements necessary for its implementation. These include host polymers, poling methodologies, and molecular spacer systems that are customized to achieve specific optical properties. Our organic electro-optic polymer systems compounds are mixed into solution form that allows for thin film application. Our proprietary electro-optic polymers are designed at the molecular level for potentially superior performance, stability, and cost-efficiency. We believe our proprietary and unique polymers have the potential to replace more expensive, higher power consuming, slower-performance materials such as semiconductor modulator devices that are used in fiber-optic communication networks today.

Our patented and 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 that enables our core molecular structures to maintain stability under a broad range of operating conditions.

We expect our patented and patent-pending optical materials along with trade secrets and licensed materials, to be the core of and the enabling technology for future generations of optical devices, modules, sub-systems, and systems that we will develop or potentially out-license to electro-optic device manufacturers, contract manufacturers, original equipment manufacturers, etc. Our Company contemplates future applications that may address the needs of semiconductor companies, optical network companies, Web 2.0/3.0 media companies, high performance computing companies, telecommunications companies, aerospace companies, automotive companies, as well as for example, government agencies.

##### **Device Design and Development**

###### *Electro-optic Modulators*

Our Company designs its own proprietary electro-optical modulation devices. Electro-optical modulators convert data from electric signals into optical signals that can then be transmitted over high-speed fiber-optic cables. Our modulators are electro-optic, meaning they work because the optical properties of the polymers are affected by electric fields applied by means of electrodes. Modulators are key components that are used in fiber optic telecommunications, data communications, and

data centers networks etc., to convey the high data flows that have been driven by applications such as pictures, video streaming, movies etc., that are being transmitted through the Internet. Electro-optical modulators are expected to continue to be an essential element as the appetite and hunger for data increases every year as well as the drive towards lower power consumption, and smaller footprint (size).

#### *Polymer Photonic Integrated Circuits*

Our Company also designs its own proprietary Photonic Integrated Circuits (otherwise termed a polymer PIC). A polymer PIC is a photonic device that integrates several photonic functions on a single chip. We believe that our technology can enable the ultra-miniaturization footprint needed to increase the number of photonic functions residing on a semiconductor chip to create a progression like what was seen in the computer integrated circuits, commonly referred to as Moore's Law. One type of integration is to combine several instances of the same photonic functions such as a plurality of modulators to create a multi-channel polymer PIC. The number of channels can be varied depending on application. For example, the number of photonic components could increase by a factor of 4, 8, or 16. Another type of integration is to combine different types of devices including from different technology bases such as the combination of a semiconductor laser with a polymer modulator. Our P<sup>2</sup>IC™ platform encompasses both these types of architecture.

Current semiconductor photonic technology today is struggling to reach faster device speeds. Our modulator devices, enabled by our electro-optic polymer material systems, work at extremely high frequencies (wide bandwidths) and possess inherent advantages over current crystalline electro-optic material contained in most modulator devices such as bulk lithium niobate (LiNbO<sub>3</sub>), indium phosphide (InP), silicon (Si), and gallium arsenide GaAs). Our advanced electro-optic polymer platform is creating a new class of modulators such as the Polymer Stack™, Polymer Plus™, Polymer Slot™, and associated PIC platforms that can address higher data rates in a lower cost, lower power consuming manner, smaller footprint (size) with much simpler data encoding techniques. Our electro-optic polymer material will boost the performance of standard PIC platforms such as silicon photonics and indium phosphide.

Our electro-optic polymers can be integrated with other materials platforms because they can be applied as a thin film coating in a fabrication clean room such as may be found in semiconductor foundries using standard clean room tooling. These approaches enable our Polymer Plus™ and Polymer Slot™ device platforms. Our polymers are unique in that they are stable enough to seamlessly integrate into existing CMOS, Indium Phosphide (InP), Gallium Arsenide (GaAs), and other semiconductor manufacturing lines. Of relevance are the integrated silicon photonics platforms that combine optical and electronic functions. These include a miniaturized modulator for ultra-small footprint applications in which we term the Polymer Slot™. This design is based on a slot modulator fabricated into semiconductor wafers that can include either silicon or indium phosphide.

Our Company has a fabrication facility in Colorado to apply standard fabrication processes to our electro-optic polymers which create modulator devices. While our internal fabrication facility is capable of manufacturing modulator devices, we have partnered with commercial silicon-based fabrication companies that are called foundries who can scale our technology with volume quickly and efficiently. The process recipe for fabrication plants or foundries is called a 'process development kit' or PDK. We are currently working with commercial foundries to implement our electro-optic polymers into accepted PDKs by the foundries. One of the metrics for successful implementation of PDK is to receive working modulator chips. Our work with the foundries is being focused with the Polymer Plus™ and the Polymer Slot™ polymer modulators.

#### **Business Strategy**

Our business strategy 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; and (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 to continue to:

- Further the development of proprietary organic electro-optic polymer material systems
- Develop photonic devices based on our P<sup>2</sup>IC™ technology
- Develop proprietary intellectual property
- Grow our commercial device development capabilities
- Partner with silicon-based foundries who can scale volume quickly

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- Grow our product reliability and quality assurance capabilities
- Grow our optoelectronic packaging and testing capabilities
- Grow our commercial material manufacturing capabilities
- Maintain/develop strategic relationships with major telecommunications and data communications companies to further the awareness and commercialization of our technology platform
- Add high-level personnel with industrial and manufacturing experience in key areas of our materials and device development programs.

We commenced commercial operations in May 2023 with our entry into a material supply license agreement to provide Perkinamine® chromophore materials for polymer based photonic devices and photonic integrated circuits (PICs).

#### *Create Organic Polymer-Enabled Electro-Optic Modulators*

We intend to utilize our proprietary optical polymer technology to create an initial portfolio of commercial electro-optic polymer product devices with applications for various markets, including telecommunications, data communications and data centers. These product devices will be part of our proprietary photonics integrated circuit (PIC) technology platform.

We expect our initial modulator products will operate at symbol rates at least 112 Gbaud which is roughly 200Gbps when utilized with PAM4 encoding schemes. Our devices are highly linear and can also enable the performance required to take advantage of more advanced complex encoding schemes if required.

#### **Our Proprietary Products in Development**

As part of a tactical marketing strategy, our Company is developing several optical devices using our proprietary electro-optical polymer material, which are in various stages of development. These include:

##### *Ridge Waveguide Modulator, Polymer Stack™*

Our ridge electro-optic waveguide modulator was designed and fabricated in our in-house laboratory. The fabrication of our first in-house device is significant to our entire device program and is an important starting point for modulators that are being developed for target markets. We have multiple generations of new materials that we will soon be optimizing for this specific design. In September 2017 we announced that our initial alpha prototype ridge waveguide modulator, enabled by our P<sup>2</sup>IC™ polymer system, demonstrated bandwidth performance levels that will enable 112 Gbaud modulation in fiber-optic communications. This device demonstrated true amplitude (intensity) modulation in a Mach-Zehnder modulator structure incorporating our polymer waveguides. This important achievement will allow users to utilize arrays of 4 x 112 Gbaud symbol rate (4x 200 Gbps data rate) polymer modulators using PAM-4 encoding to enable 800 Gbps data rate systems. These ridge waveguide modulators are currently being packaged with our partner into prototype packages.

These prototype packages will enable potential customers to evaluate the performance at 112 Gbaud. Once a potential customer generates technical feedback on our prototype, we expect to be asked to optimize the performance to their specifications. Assuming this is successful, we expect to enter a qualification phase where our prototypes will be evaluated more fully.

In parallel, we are developing modulators for scalability to higher symbol rates above 112 Gbaud. In September 2018, we showed in conference presentations the potential of our polymer modulator platform to operate at over 100 GHz bandwidth. This preliminary result corresponds to 100 Gbps data rates using a simple NRZ data encoding scheme or 200 Gbps with PAM-4 encoding. With 4 channel arrays in our P<sup>2</sup>IC™ platform, the Company thus has the potential to address both 400 Gbps and 800 Gbps markets. While customers may start the engagement at 112 Gbaud, we believe potential customers recognize that scalability to higher speeds is an important differentiator of the polymer technology.

We believe the ridge waveguide modulator Polymer Stack™ represents our first commercially viable device and targets the fiber optics communications market. We have completed internal market analysis and are initially targeting interconnect reach distances of less than 1km. In these markets, the system network companies are looking to implement modulator-based transceivers that can handle aggregated data rates 800 Gbps and above. The market opportunity for less than 10km is worth over \$2B over the next decade.

#### *Polymer Plus™*

Using our novel waveguide design, we are developing a more compact modulator to be implemented directly with existing integrated photonics platforms such as silicon photonics and Indium Phosphide. As our electro-optic polymers are applied in liquid form, they can be deposited as a thin film coating in a fabrication clean room such as may be found in semiconductor foundries. This approach we call Polymer Plus™. The advantage of this approach is that it allows existing semiconductor integrated photonics platforms such as silicon photonics and indium phosphide to be upgraded with higher speed modulation functionality with the use of polymers in a straight-forward and simple approach. Further, our polymers are unique in that they are stable enough to seamlessly integrate into existing CMOS, Indium Phosphide (InP), Gallium Arsenide (GaAs), and other semiconductor manufacturing lines.

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A large majority of commercial silicon photonics platforms utilize large silicon photonics foundries such as those that manufacture IC products for a number of applications such as communications, computing, consumer, etc. In order to seamlessly integrate our polymer materials to upgrade for example, silicon photonics designs, partnering with a silicon foundry is necessary.

#### *Polymer Slot™*

As part of supporting further improvement and scalability of our platform, we continue to develop more advanced device structures that include the Polymer Slot™. Our high performance, low power, extremely small footprint polymer photonics slot waveguide modulator utilizes a slot design that is part of PIC platform such as silicon photonics with one of our proprietary electro-optic polymer material systems as the enabling material layer. Initial performance results in 2022 from commercial foundries achieved key design specifications for the slot modulator.

Preliminary testing and initial data on our polymer photonics slot waveguide modulators fabricated at commercial foundries demonstrated extremely high performance suitable for the hyperscaler and fiber optics markets. The tested polymer photonic slot chip had less than 1-millimeter square footprint, enabling the possibility of sophisticated PIC architecture designs on a single silicon substrate. In addition, the waveguide structure was a fraction of the length of a typical inorganic-based silicon photonics modulator waveguide and is suitable to be used as an engine for state-of-the-art pluggable transceiver modules such as the OSFP and the QSFP-DD.

With the combination of our proprietary electro-optic polymer material and the extremely high optical field concentration in the slot waveguide, the test modulators demonstrated very low operating voltage. Initial speeds exceeded 70GHz in the telecom, 1550 nanometer frequency band, and there were devices that exceeded over 100GHz 3dB bandwidth.

We are also continuing our collaborative development of our polymer photonic slot waveguide modulators (Polymer Slot™) with a partner that has advanced device design capabilities using Plasmonic technologies. Some of these devices demonstrated performance levels that exceeded 250GHz in 2022.

#### *Our Long-Term Device Development Goal - Multichannel Polymer Photonic Integrated Circuit (P<sup>2</sup>IC™)*

Our P<sup>2</sup>IC™ platform is positioned to address markets with aggregated data rates of 100 Gbps, 400 Gbps, 800 Gbps and beyond. Our P<sup>2</sup>IC™ platform will contain several photonic devices that may include, over and above polymer-based modulators, photonic devices such as lasers, multiplexers, demultiplexers, detectors, fiber couplers.

While our polymer-based ridge waveguide and slot modulators are currently under development to be commercially viable products, our long-term device development goal is to produce a platform for the 400 Gbps, 800 Gbps, 1600Gbps and beyond fiber optic transceiver market. This has been stated in our photonics product roadmap that is publicly available on our website. The roadmap shows a progression in speed from 50 Gbaud based modulators to 100 Gbaud based modulators. The roadmap shows a progression in integration in which the modulators are arrayed to create a flexible, multichannel P<sup>2</sup>IC™ platform that spans 100 Gbps, 400 Gbps, 800 Gbps, 1.6Tbps (or 1600Gbps), and a scaling philosophy that will grow to 3.2Tbps line rates.

We showed bandwidths of polymer-based modulator devices at a major international conference (ECOC – European Conference on Optical Communications 2018) with bandwidths that exceeded 100GHz. We noted that to achieve 100Gbaud, the polymer-based modulator only needs to achieve 80GHz bandwidth. During ECOC 2019, we showed environmental stability. We continue to develop our polymer materials and device designs to optimize additional metrics. We are now optimizing the device parameters for very low voltage operation. At the ECOC 2022 conference we demonstrated two different world record performances using polymer slot based modulators.

#### **Our Target Markets**

##### *Cloud computing and data centers*

*Big data* is a general term used to describe the voluminous amount of unstructured and semi-structured data a Company creates – data that would take too much time and cost too much money to load into a relational database for analysis. Companies are looking to cloud computing in their data centers to access all the data. Inherent speed and bandwidth limits of traditional solutions and the potential of organic polymer devices offer an opportunity to increase the bandwidth, reduce costs, improve speed of access, and to reduce power consumption both at the device as well as the system level.

Datacenters have grown to enormous sizes with hundreds of thousands and even millions of servers in a single datacenter. The number of so-called “hyperscale” datacenters are expected to continue to increase in number. Due to their size, a single “datacenter” may consist of multiple large warehouse-size buildings on a campus or even several locations distributed around a metropolitan area. Data centers are confronted with the problem of moving vast amounts of data not only around a single data center building, but also between buildings in distributed data center architecture. Links within a single datacenter building may be shorter than 500 meters, though some will require optics capable of 2 km. Between datacenter buildings, there is an increasing need for high performance interconnects over 10km in reach.

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Our modulators are suitable for single-mode fiber optic links. We believe that our single mode modulator solutions will be competitive at 500m to 10km link distance lengths, with inherent advantages for 800Gbps applications.

##### *Telecommunications/Data Communications*

The telecommunications industry has evolved from transporting traditional analogue voice data over copper wire into the movement of digital voice and data.

Telecommunication companies are faced with the enormous increasing challenges to keep up with the resulting tremendous explosion in demand for bandwidth. The metropolitan network is especially under stress now and into the near future. Telecommunications companies provide services to some data center customers for the inter-data center connections discussed above. 5G mobile upgrade, autonomous driving and IoT are expected to increase the need for data stored and processed close to the end user in edge data centers. This application similarly requires optics capable of very high speeds and greater than 10 km reach.

#### *Industry issues of scaling*

The key issues facing the fiber-optic communications industry are the economic progress and scalability of any PIC based technological platform. Our polymer platform is unique in that it is truly scalable and is expected to become a high performance engine for transceiver modules. Scalable means being able to scale up for high-speed data rates, while simultaneously being able to scale down in cost, and lower power consumption. This allows a competitive cost per data rate or cost per Gbps metric to be achieved.

Fiber optic datacenter and high-performance computing customers want to achieve the metric of \$1/Gbps @ 800Gbps (this essentially means a single mode fiber optic link that has a total cost of \$800 and operates with a data rate of 800Gbps). Equally importantly, the datacenter industry would like to reduce the power consumption of optical ports for 400Gbps, 800Gbps, etc., significantly. As industry tries to match this target, it needs scalable PIC platforms to achieve this goal, of which our polymer platform is uniquely suited.

An article by Dr. Michael Lebby that was recently published in broadband communities (BBC) magazine in early February 2023 discusses the virtues of polymer based technologies as part of an industry technology roadmap. The article is entitled "The internet is the brick wall Nostradamus did not see coming." In this article cost/performance metrics are discussed that show the trend to higher and higher data rates using PIC platforms that include very high speed, low power modulator devices.

The article also shows that electro-optic polymers play an important role in PICs over the next decade as they can reduce or close the gap between customer expectations and technical performance through effective scaling increase of high performance with low cost for short distance transceiver optical links.

Some of the things needed to achieve the scaling performance of polymers in integrated photonics platforms is within sight today:

1. Increased  $r_{33}$  (which leads to very low  $V_{pi}$  in modulator devices) and we are currently optimizing our polymers for this. With  $V_{pi}$  levels of 1V or less will enable direct from associated electronics and potentially save network architects the cost of individual driver ICs.
2. Increase temperature stability so that the polymers can operate at broader temperature ranges effective, where we have made significant progress over the past few years.
3. Low optical loss in waveguides and active/passive devices for improved optical budget metrics which is currently an ongoing development program at our Company.
4. Higher levels of hermeticity for lower cost packaging of optical sub-assemblies within a transceiver module, where our advanced designs are being implemented into polymer-based packages that utilize atomic layer deposition (ALD) that is being developed in-house.

Scalability in terms of cost reduction and high volume manufacturing can be enhanced by:

1. Leverage of commercial silicon photonics manufacturing capacity through the use of silicon-based foundries. Our Polymer Plus™ platform seeks to be additive to standard silicon photonics circuits.
2. Reduction of optical packaging costs by integration at the chip level of multiple modulators and also with other optical devices. Our P<sup>2</sup>IC™ platform seeks to address device integration.

#### **Recent Significant Events and Milestones Achieved**

During February and March 2018, we moved our Newark, Delaware synthetic laboratory and our Longmont, Colorado optical testing laboratory and corporate headquarters to office, laboratory and research and development space located at 369 Inverness Parkway, Suite 350, Englewood, Colorado. The Englewood facility includes fully functional 1,000 square feet of class 1,000 cleanroom, 500 square feet of class 10,000 cleanroom, chemistry laboratories, and analytic laboratories. In August 2018 we completed (ahead of schedule) our fully equipped on-site fabrication facility to expand our high-speed test and design capabilities. In August 2023, we completed new laboratory production facilities, expanding the Englewood facility by over 65%, nearly 10,000 square feet, for a total of approximately 23,500 square feet to support new commercial activity, including enabling commercial device testing and evaluation, production reliability testing, laser characterization, SEM analysis and the expansion of our Company's chemical synthesis production line. Our Englewood facility streamlines all of our Company's research and development and production workflow for greater operational efficiencies

During March 2018, our Company, together with our packaging partner, successfully demonstrated packaged polymer modulators designed for 50Gbaud, which we believe will allow us to scale our P<sup>2</sup>IC™ platform with our Mach-Zehnder ridge waveguide modulator design as well as other photonics devices competitively in the 100Gbps and 400Gbps datacom and telecommunications applications market. We are currently fine-tuning the performance parameters of these prototypes in preparation for customer evaluations.

During June 2018, our Company Acquired the Polymer Technology Intellectual Property Assets of BrPhotonics Productos Optoelectrónicos S.A., a Brazilian corporation, which significantly advanced our patent portfolio of electro-optic polymer technology with 15 polymer chemistry materials, devices, packaging and subsystems patent and further strengthened our design capabilities to solidify our market position as we prepare to enter the 400Gbps integrated photonics marketplace with a highly competitive, scalable alternative to installed legacy systems.

Also, during June 2018, our Company promoted polymer PICs and Solidified Polymer PICs as Part of the Photonics Roadmap at the World Technology Mapping Forum in Enschede, Netherlands, which includes our Company's technology of polymers and polymer PICs that have the potential to drive not only 400Gbps aggregate data rate solutions, but also 800Gbps and beyond.

In August 2018 we announced the completion (ahead of schedule) of our fully equipped on-site fabrication facility, where we are expanding our high-speed test and design capabilities. We also announced the continuation of the building of our internal expertise with the hiring of world-class technical personnel with 100Gbps experience. In August 2023, we announced the completion of new laboratory production facilities, expanding our corporate headquarters by over 65%, nearly 10,000 square feet, for a total of approximately 23,500 square feet to support new commercial activity, including enabling commercial device testing and evaluation, production reliability testing, laser characterization, SEM analysis and the expansion of our Company's chemical synthesis production line.

In February 2019 we announced a major breakthrough in our development of clean technology polymer materials that target the insatiable demand for fast and efficient data communications in the multi-billion-dollar telecom and data markets supporting Internet, 5G and IoT (Internet of Things) webscale services. The improved thermally stable polymer has more than double the electro-optic response of our previous materials, enabling optical device performance of well over 100 GHz with extremely low power requirements. This addition to the family of Perkinamine™ polymers will hold back run-away consumption of resources and energy needed to support ever-growing data consumption demands. We continue to conduct testing of the material and assessment of associated manufacturing processes and device structures prior to release to full development.

In March 2019 we created an Advisory Board comprised of three world-class leaders in the photonics industry: Dr. Craig Ciesla, Dr. Christoph S. Harder, and Mr. Andreas Umbach. In January 2022 Dr. Ciesla was named to our Board of Directors, and our Advisory Board is currently comprised of Dr. Franky So, Dr. Christoph S. Harder, Mr. Andreas Umbach and Dr. Joseph A. Miller, who is a former member of our Board of directors. The Advisory Board is working closely with our Company leadership to enhance our Company's product positioning and promote our polymer modulator made on our proprietary *Faster by Design*™ polymer P<sup>2</sup>IC™ platform. The mission of the Advisory Board is initially to increase our Company's outreach into the datacenter interconnect market and later to support expansion into other billion-dollar markets. The Advisory Board members have each been chosen for their combination of deep technical expertise, breadth of experience and industry relationships in the fields of fiber optics communications, polymer and semiconductor materials. Each of the Advisory Board members has experience at both innovators

like Lightwave Logic and large industry leaders of the type most likely to adopt game-changing polymer-based products. In addition, they possess operational experience with semiconductor and polymer businesses.

Also, in March 2019, our Company received the "Best Achievement in PIC Platform" award for our 100 GHz polymer platform from the PIC International Conference. The award recognizes innovative advances in the development and application of key materials systems driving today's photonic integrated circuits (PICs) and providing a steppingstone to future devices.

During the second quarter of 2019, our Company promoted its polymers at ColInnovate in May and the World Technology Mapping Forum in June. ColInnovate is a meeting of semiconductor industry experts. The World Technology Mapping Forum is a group authoring a photonics roadmap out to 2030.

In September 2019 at the prestigious European Conference on Communications (ECOC) in Dublin, Ireland, we showed measured material response over frequency and the resulting optical data bits stream on our clean technology polymer materials, the newest addition to our family of Perkinamine™ polymers, that meet and exceed of our near-term target speed of 80 GHz. We also released data demonstrating stability under elevated temperatures in the activated (poled to create data carrying capability) state.

In October 2019, we reported that energy-saving polymer technology is highlighted in the recently published Integrated Photonics Systems Roadmap - International (IPSR-I). The roadmap validates the need for low-voltage, high-speed technologies such as ours.

In May 2020, we announced that our latest electro-optic polymer material has exceeded target performance metrics at 1310 nanometers (nm), a wavelength commonly used in high-volume datacenter fiber optics. This material demonstrates an attractive combination at 1310 nm of high electro-optic coefficient, low optical loss and good thermal stability at 85° Celsius. The material is expected to enable modulators with 80 GHz bandwidth and low drive power, and has an electro-optic coefficient of 200 pm/V, an industry measure of how responsive a material is to an applied electrical signal. This metric, otherwise known as r33, is very important in lowering power consumption when the material is used in modulator devices. This technology is applicable to shorter reach datacenter operators, for whom decreasing power consumption is imperative to the bottom line of a facility. We considered this a truly historic moment—not only in our Company's history, but in our industry—as we have demonstrated a polymer material that provides the basis for a world-class solution at the 1310 nm wavelength, something which other companies have spent decades attempting to achieve.

In July 2020, we announced the official launch of our new corporate website [www.lightwavelogic.com](http://www.lightwavelogic.com), reflecting ongoing efforts to provide up-to-date information for investors and potential strategic partners. The revamped website offers a clean, modern design integrated with helpful tools and investor relations resources, including a new corporate explainer video, to illustrate the target markets and advantages of Lightwave Logic's proprietary electro-optic polymers.

In August 2020, we announced the addition of Dr. Franky So, a leading authority in the OLED industry, to our Advisory Board. Dr. So is the Walter and Ida Freeman Distinguished Professor in the Department of Materials Science and Engineering at North Carolina State University. Previously, he was the Head of Materials and Device research for OLEDs at OSRAM Opto Semiconductors, as well as Motorola's corporate research lab in the 1990s. Dr. So was an early researcher in electro-optic (EO) polymer modulators at Hoechst Celanese. As a member of the Company's advisory board, Dr. So will work closely with management to enhance Lightwave's product positioning for, as well as the promotion of, its polymer modulators made on its proprietary platform. In addition, he will provide technical support and advisory services to the Lightwave materials and device teams.

On October 7, 2020 we announced the receipt of U.S. Patent number 10,754,093 that improves both the performance and reliability of our high-speed, low-power electro-optic polymer modulators intended for datacenter and telecommunications applications. The patent allows multi-layered electro-optic polymer modulators to perform more efficiently through the design of custom interfaces. These interfaces are designed into the cladding layers that allow optical transmission, electrical conductivity, material integrity, as well as a prevention of solvents affecting adjacent polymer materials. The net impact of all of this allows for our Company's modulators to improve performance across the board, enabling higher reliability in the fiber optic communications environment.

On October 15, 2020, we announced that our proprietary polymer technologies are compatible with currently available integrated photonics platforms. Our proprietary electro-optic materials are currently in the prototyping phase and are fabricated onto standard silicon wafers, and this Polymer Plus™ advancement, driven by the feedback our Company received from potential customers to-date, has allowed our materials to be suitable for additive integration to integrated photonics platforms such as silicon photonics, as well as indium phosphide and other standard platforms – therefore enabling simpler integration by customers. We believe this breakthrough allows a polymer modulator to enhance the performance of existing integrated photonics solutions in the marketplace, enabling higher speed and lower power consumption on foundry-fabricated photonics designs. Since our technology is additive to existing platforms such as silicon photonics, our electro-optic polymers are not actually competing with integrated photonic platforms, but rather enabling them to be more competitive in the marketplace, and it further validates our EO polymer platform as ideally suited to enable optical networking more efficiently than ever.

On October 21, 2020, we announced that we have optimized a robust, photo-stable organic polymer material for use in our next-generation modulators intended to be trialed with potential customers under NDA. Our materials show high tolerance to high-intensity infrared light, common in a fiber optic communications environment and increasingly important as higher density of devices access the network, directly resulting in higher intensity infrared light levels. Our preliminary results suggest that our recently developed electro-optic polymer material, designed based on potential customer input, displays unrivaled light tolerance (also known as photostability) compared to any organic commercial solution in use today. Our results meet both our current internal criteria and address potential customer feedback.

On November 2, 2020, we disclosed results on our polymer material stability testing including further results for electro-optic efficiency for our Company's materials that operate both at 1550nm as well as 1310nm. We demonstrated test materials results for electro-optic efficiency to 4000hrs, improvement in sensitivity to oxygen as part of a broadband exposure test, and stability for polymers exposed to 1310nm light at 100mW.

On November 20, 2020 we announced the receipt of U.S. Patent number 10,591,755 that details an important invention that allows users of electro-optic polymer modulators to not only operate the devices with high speed and low power directly from CMOS IC chips, but gives them the opportunity to avoid the expense, physical footprint and power consumption of high-speed modulator driver ICs. Furthermore, this patent strengthens our freedom of manufacturing, and directly enables our modulators to become more competitive in the marketplace.

On December 16, 2020 we announced the development of a new sealant for our future Chip-on-Board (COB) packaged polymer platform. The sealant, which blocks oxygen and other atmospheric gases, is a key step in our Company's development towards a polymer modulator without a package, an important enabling technology for the industry. We plan to develop the sealant for commercial implementation in our future modulators. Recent results suggest that our electro-optic polymer sealant material displays encouraging barrier properties and is expected to translate to significant improvement in bare chip robustness against atmospheric gases, as compared to existing EO polymer commercial solutions in use today. While the initial measurements are highly promising, our Company plans to continue development work to further optimize the sealant material and barrier performance towards the chip-on-board goal.

On January 13, 2021, we announced the receipt of U.S. Patent number 10,886,694 that details an invention that allows electro-optic polymer modulators to be packaged in a hermetic environment using well-known, high-volume and low-cost fabrication processes that are available in a typical semiconductor fabrication foundry – improving suitability for mass production. Further, the design of this capsule package can improve both the reliability and the coupling interface between fiber optic cables and their laser sources for arrayed photonic integrated circuit solutions. The package can also interpose signals from an underlying circuit board to the polymer modulators, lasers, and other components for data transfer. The hermetic capsule is built from a semiconductor base that contains electrical and optical circuits and components. A hermetic capsule chamber is created by the design of a semiconductor lid that is sealed to the semiconductor base platform by a metallization process. Using standardized fabrication techniques we can now create a package that achieves the performance, reliability, cost, and volume requirements that has been a challenge for the photonics industry for years.

On May 11, 2021, we announced the receipt of U.S. Patent number 10,989,871 that details an invention that allows for improved protective polymer layers in modulators when designed into advanced integrated photonic platforms, better positioning them for high-volume manufacturing processes. The protective layers will enhance electro-optic polymer devices' performance through higher reliability, better optical performance and enable the use of standardized manufacturing processes best suited for mass-production.

On June 7, 2021, we announced that our company's common stock was added to the Solactive EPIC Core Photonics EUR Index NTR as part of the index's semi-annual additions. The index includes global public companies with a common theme of optoelectronics, photonics, and optical technologies in general that range from components, modules, manufacturers, and optical network system companies. This inclusion broadens our exposure to the capital markets community, as well as credibility with potential partners and customers.

On June 16, 2021, we announced test results from new modulators fabricated in 2021, which exceeded bandwidth design targets and achieved triple the data rate as compared to competing devices in use today. The breakthrough new devices demonstrated 3dB electro-optical with electrical bandwidths that exceed 100GHz – with measurements coming close to our Company's state-of-the-art 110GHz test equipment capability. We expect this advancement to have a profound impact on the traffic flow on the internet.

On June 24, 2021, we announced the receipt of U.S. patent number 11,042,051 that details a breakthrough new device design that enables mass-volume manufacturing when designed into advanced integrated photonic platforms. The device design enhances reliability, improves optical mode control and most important, lowers by consumption through the use of direct-drive, low-voltage operation. The patent is entitled, "Direct drive region-less polymer modulator methods of fabricating and materials therefor" and is expected to open the opportunity for low power consumption electro-optic polymers to be developed into large foundry PDKs (process development kits) and be ready for mass volume commercialization. The patent emphasizes our technology platform using fabrication techniques that would naturally fit into foundry PDKs.

On August 4, 2021, we announced that we developed improved thermal design properties for electro-optic polymers used in our Polymer Plus™ and Polymer Slot™ modulators, enabling the speed, flexibility and stability needed for high-volume silicon foundry processes. We successfully created a 2x improvement in r33, while allowing higher stability during poling and post-poling. This provides better thermal performance and enables greater design flexibility in high-volume silicon foundry PDK (process development kit) processes.

On August 9, 2021, we announced the receipt of U.S. patent number 11,067,748 entitled "Guide Transition Device and Method" that covers a new invention that enables enhanced optical routing architectures for polymer-based integrated photonics that can be scaled with partner foundries. This new invention will enable innovative, highly scalable optical routing architectures for integrated photonic platforms. The patent provides novel optical waveguide transition designs using two planes of optical waveguides that are expected to be critical for optical signal routing and optical switching, opening the opportunity for high speed, energy efficient electro-optic polymers to be implemented into foundry PDKs (process development kits) to improve the performance of integrated photonic circuits. This breakthrough technology opens the door for advanced integrated photonics architectural design. We believe the simplicity of the design is ideal for production in foundries and will best position our Company to enable increased data traffic on the internet while using less power.

On September 1, 2021, our Company's common shares began trading on the Nasdaq Capital Market ("Nasdaq"). The Company's Nasdaq listing will help to expand our potential shareholder base, improve liquidity, elevate our public profile within the industry and should ultimately enhance shareholder value.

On September 15, 2021, we announced the receipt of the 2021 Industry Award for Optical Integration from the European Conference on Optical Communications (ECOC), a premier industry exhibition that was held in Bordeaux from September 13-15, 2021. ECOC created the fiber communication industry awards in six categories to put the spotlight on innovation happening within the industry. The awards recognize and highlight key industry achievements in advancing optical components, photonic integration, optical transport and data center innovation. The awards are selected from top industry players, representing significant innovation in photonics integration at our prestigious exhibition.

On September 16, 2021, we announced the achievement of world-record performance for a polymer modulator, as demonstrated in an optical transmission experiment by ETH Zurich, using our Company's proprietary, advanced Perkinamine™ chromophores and Polariton Technologies Ltd.'s newest plasmonic EO modulator, a silicon-photonics-based plasmonic racetrack modulator offering energy-efficient, low-loss, and high-speed modulation in a compact footprint. The groundbreaking results were presented as a post-deadline paper at the prestigious European Conference on Optical Communications (ECOC) industry exhibition and conference in Bordeaux on September 16, 2021. Polariton's plasmonic modulator transmitted 220 Gbit/s OOK and 408 Gbit/s 8PAM. Transmission of an optical signal was conducted over 100 m using a low-voltage electrical drive of 0.6Vp, an on-chip loss of 1 dB, and an optical 3 dB bandwidth of beyond 110 GHz.

On January 3, 2022, we announced the publication of our patent application 20210405504A1 by the United States Patent and Trademark Office (USPTO) – entitled '*Nonlinear Optical Chromophores Having a Diamondoid Group Attached Thereto, Methods of Preparing the Same, and Uses Thereof*' – which significantly improves the overall stability and performance of our electro-optic polymers. The Company's electro-optic chromophores are designed to have one or more diamondoid molecular groups attached to the chromophore. When such chromophores are dispersed in a host polymer matrix, the electro-optic materials result in improved macroscopic electro-optic properties, increased poling efficiency, increased loading as well as increased stability of these materials after poling. The impact of this technology is that it will accelerate the path for very high-speed, low-power electro-optic polymers to be implemented into large foundry process development kits ("PDKs") to boost performance of integrated photonic circuits.

On January 3, 2022, we announced that we enhanced our Company's Foundry Process Development Kit Offering with the addition of Optical Grating Couplers. This expanded design tool kit will enable silicon foundries to implement PDKs and fabricate modulators and optical gratings in a single fab run, further enhancing modulator efficacy. We are continuing to work on additional design tool kit components to enable an expedited commercialization process through a more simplified manufacturing process for our foundry partners.

On January 3, 2022, we announced that we appointed respected industry leader Dr. Craig Ciesla to our Board of Directors and that retired director Dr. Joseph A. Miller transitioned to our Company's Advisory Board. Dr. Ciesla is currently the Vice President, Head of the Advanced Platforms and Devices Group at Illumina, a leading provider of DNA sequencing and array technologies. There he leads a team driving innovation in sequencing platforms, microfluidics, electronics, and nanofabrication. Prior to Illumina, he was Vice President of Engineering at Kajam, where he was responsible for the development and production of 100G transceivers for the data-center market. He was also the founding CEO of Tactus Technology, an innovator in the user interface industry, where he was the co-inventor of Tactus' polymer morphing screen technology. Before Tactus he had a variety of roles at Intel, JDSU (now Lumentum), Bookham (now Oclaro) and Ignis Optics developing a wide range of products in the fiber-optics market. He started his career at Toshiba Research Europe, where he performed early terahertz images of skin cancer. Dr. Ciesla holds a BSc (Hons.) in Applied Physics and Ph.D. in Physics from Heriot-Watt University in Edinburgh.

On February 10, 2022, we announced breakthrough photostability results on our electro-optic polymer modulators that are compatible with high-volume silicon foundry processes. The improved photostability of our polymers are expected to minimize any optical losses and provide a more robust platform for silicon foundries. This breakthrough photostability performance is incredibly important as we optimize our polymers for high-volume silicon foundry processes.

On March 7, 2022, we announced the receipt of U.S. patent number 11,262,605 entitled, "Active region-less polymer modulator integrated on a common PIC platform and method." This invention will simplify modulator integration for high-volume foundry manufacturing operations while enhancing polymer reliability to enable a more effective photonic engine. The essence of the invention is a complete optical engine that fits into fiber optic transceivers (either pluggable or co-packaged) that are used in routers, servers and elsewhere in optical networks. The engine is designed for high-volume manufacturing operations using silicon foundry infrastructure. The patent illustrates the use of our polymer modulators as a high speed, low power engine not only for data communication and telecommunication applications, but other new market opportunities as well.

On March 22, 2022 we announced the achievement of world-class results for a polymer modulator, as demonstrated in an enhanced stability and high-speed measurement by Polariton Technologies and ETH Zurich. The results were generated using the Company's proprietary, advanced Perkinamine™ chromophores in Polariton's silicon-photonics-based plasmonic racetrack modulator that offers energy-efficient, low-loss, and high-speed modulation in a compact footprint that is ideal for pluggable and/or co-packaging transceiver modules. The plasmonic modulator performance was compared to that of silicon photonic microring modulators. The plasmonic device, using Lightwave Logic's electro-optic polymer material, was shown to be 250-3000x more stable than the silicon devices relative to operating condition changes. In addition, the plasmonic modulator was tested for 70+ minutes at 100 Gbps NRZ at 80C with no decrease in performance. The world-class results were presented as a contributed peer-reviewed paper at the prestigious 2022 Optical Fiber Conference (OFC2022), the optical communication industry's leading international technical conference and trade show, in San Diego on March 10, 2022.

On April 19, 2022, we announced the publication of our patent application 2022/0113566 A1 entitled "TFP (thin film polymer) optical transition device and

method" that illustrates the design of a simpler to fabricate, lower cost hybrid integrated photonics chip using electro-optic polymers which are more advantageous for high-volume production. The invention will simplify polymer modulator fabrication when integrated with silicon photonics for high-volume foundry manufacturing applications. The simplified fabrication approach enables us to simplify the production of very high speed, low power proprietary polymer modulators that will enable significantly faster data rates in the internet environment. The essence of the invention is a hybrid polymer-silicon photonics engine that fits into fiber optic transceivers (either pluggable or co-packaged) that are used in the routers, servers and network equipment that are proliferating with the growth of data centers, cloud computing and optical communications capacity. The hybrid polymer-silicon photonics engine is designed to use high-volume silicon foundry infrastructure.

On May 25, 2022, we announced enhanced photostability results on our Company's proprietary electro-optic polymer modulators – demonstrating the reliability necessary for commercial deployments – all based on a technology which can be ported into high-volume silicon foundries and integrated onto a silicon photonics platform with other optical devices. Photostability is a critical performance metric required both in high volume manufacturing processes (such as photolithography) and in offering the high reliability and network availability required for commercial deployments. In the tests conducted, subjecting the Company's latest polymers to high intensity optical power for over 3000 hours produced no change in device performance. The ability of our proprietary polymers to pass this accelerated photostability aging test provides assurance that they will both tolerate the optical exposures which occur in high-volume manufacturing and support the reliability over the required operating life of optical transceivers and network elements.

On June 21, 2022, we announced the publication of our patent application 2022/0187637A1 entitled "Hybrid electro-optic polymer modulator with silicon photonics" that details a novel fabrication process that allows our Company's proprietary polymers to be fabricated by silicon foundries in a high-volume manufacturing environment. The published patent application also details a more efficient process that allows for high yielding, high stability poling of polymers in a high-volume foundry manufacturing environment. The development of the PDK for this new optical hybrid optical modulator design is now in progress with our Company's foundry partners.

June 23, 2022, we announced the publication of our patent application 2022/0187638A1 entitled " Hybrid electro-optic polymer modulator with atomic layer deposition (ALD) sealant layer" that allows our Company's proprietary polymers to be sealed to moisture and other atmospheric gases in a very low temperature and quasi-hermetic environment through the use of a chip-scale packaging approach that can be applied in parallel at wafer level (i.e. in volume) and that eliminates the need for a separate hermetic enclosure or "gold box." Chip-scale packaging is a technique that has been gathering momentum in the silicon electronics industry for the past decade to reduce device chip packaging costs and increase device performance – enabling high-volume front and back-end manufacturing as well as extremely small sizes in miniaturization. Specifically, our electro-optic polymer modulators are sealed with a low-temperature conformal atomic layer deposition dielectric layers that are supported on a silicon substrate with passive silicon photonics waveguides.

On June 27, 2022 our Company's common stock was added to the Russell 3000® Index. We expect that the awareness of being included in one of the most widely followed benchmarks will not only benefit our existing shareholders but will lead to a broader base of institutional investors. The annual Russell index reconstitution captures the 4,000 largest US stocks as of May 6, ranking them by total market capitalization. Our membership in the US all-cap Russell 3000® Index, which remains in place for one year, means automatic inclusion in the small-cap Russell 2000® Index as well as the appropriate growth and value style indexes.

On June 30, 2022, we announced that our CEO, Dr. Michael Lebby, was again invited to co-chair the Photonic Integrated Circuits (PIC) International Conference that took place June 28-29, 2022 in Brussels, Belgium. At the conference, Dr. Lebby led an invited talk entitled, "Enabling lower power consumption optical networking using high speed, low power polymer modulators", focusing on the issue of reducing power consumption in datacenters and optical networks. He also contributed to a panel session, "Hybrid PICs technology challenges and solutions," on the need for hybrid integration addressing the volume production of 3D and 2.5 integrated electronic and photonic integrated circuits (PICs) based on the utilization of large silicon foundries. This included a discussion on the use of silicon photonics with hybrid technologies such as electro-optic polymers, polymer based plasmonics, silicon nitride and III-V laser sources.

On September 22, 2022, we announced the achievement of world record performance for low-power consumption ultra-high-speed 'green' slot modulators in collaboration with Karlsruhe Institute of Technology (KIT) and its spin-off SilOriX as part of a peer-reviewed post-deadline paper presented at the prestigious 2022 European Conference on Optical Communications (ECOC) in Basel, Switzerland on September 22, 2022. The team presented the first sub-1mm Mach Zehnder-type modulators with sub-1V drive voltage that rely on Lightwave's proprietary advanced Perkinamine™ chromophores. The devices rely on the slot-waveguide device concept developed at KIT and commercialized through SilOriX. Further, the material has experimentally proven thermal stability at 85°C and offers extreme energy-efficiency along with high-speed modulation in a compact footprint. Additionally, this shows that our material can perform in a variety of device structures and designs and is positioned to significantly reduce power consumption of optical networking and to become a true 'green photonics' enabler for the industry.

On September 22, 2022, we announced the achievement of a world-record demonstration of a 250GHz super high bandwidth electro-optical-electrical (EOE) link through a collaboration with ETH Zurich. The link was demonstrated by ETH Zurich and uses Polariton's high-speed plasmonic modulators containing Lightwave's proprietary Perkinamine™ chromophores and ETH Zurich's high-speed graphene photodetectors. The link contained a plasmonic modulator using electro-optic polymer material as well as a novel metamaterial enhanced graphene photodetector featuring a 200 nm spectral window and a setup-limited<sup>1</sup> bandwidth of 500 GHz. The EOE link achieved a world record and unprecedented 250 GHz 3dB bandwidth<sup>2</sup>. This is an optical link that utilizes devices with extremely high bandwidths, and the plasmonic demonstration shows that hybrid technologies such as our electro-optic polymers and graphene together form an important technology platform for volume scalability using large silicon foundries for mass commercialization. The groundbreaking results were presented by Stephan Koepfli as part of a peer-reviewed post-deadline paper presented at the prestigious 2022 European Conference on Optical Communications (ECOC) in Basel, Switzerland on September 22, 2022.

On November 15, 2022, we announced the receipt of U.S. patent number 11,435,603 B2 entitled "TFP (thin film polymer) optical transition device and method," which illustrates the design of a simpler to fabricate, lower cost hybrid integrated photonics chip using electro-optic polymers which are more advantageous for high-volume production. The simplified fabrication approach enables streamlined production of very high speed, low power proprietary polymer modulators that will enable significantly faster data rates in the internet environment. The essence of the invention is a hybrid polymer-silicon photonics engine that fits into fiber optic transceivers (either pluggable or co-packaged) that are used in the routers, servers and network equipment that are proliferating with the growth of data centers, cloud computing and optical communications capacity.

On November 17, 2022, we announced the receipt of U.S. patent number 11,435,604 B2 entitled "Hybrid electro-optic polymer modulator with silicon photonics," which allows Lightwave Logic's proprietary polymers to be fabricated by silicon foundries in a high-volume manufacturing environment. The patent also details a more efficient process that allows for high yielding, high stability poling of polymers in a high-volume foundry manufacturing environment. From a commercial standpoint, this patent enables our polymers to be mass-produced using existing silicon foundry equipment, simplifying production for the foundry's we are working with.

On November 29, 2022, we announced our acquisition of the polymer technology and intellectual property assets of Chromosol Ltd (UK). The acquisition significantly strengthened our Company's design capabilities with foundry PDKs with extremely low temperature atomic layer deposition (ALD) processes that effectively hermetically seal polymer devices that have been prepared for high volume manufacturing. The advanced fabrication processes of ALD with temperatures below 100C will solidify our Company's market position with both the Company's manufacturing foundry partners as well as end-users as we prepare to enter the 800Gbps integrated photonics marketplace. The acquisition also advanced our Company's patent portfolio of electro-optic polymer technology with an innovative polymer chemistry device patent that has potential to increase the performance of integrated modulators through optical amplification in a photonic integrated circuit (PIC) and enhance the functionality of the PIC by integrating laser light sources made using the polymer-based gain and a laser optical cavity defined on the Silicon photonic platform, with our Company's high speed, high efficiency modulators. Having access to extremely low temperature ALD allows our Company's polymer modulators to be protected from the environment without the need for expensive and large footprint gold box packaging, propelling our Company forward with chip-scale packaging as required by major hyper-scaler end-users. The patent opens a new class of PICs which expands our variety of devices. The Patent is US patent number 9837794, EU patent number 3017489, China registration number 201480048236 & 201910230856, and is entitled, "Optoelectronic devices, methods of fabrication thereof and materials therefor."

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<sup>1</sup> Set-up limited' indicates that the measurement was limited by the testing equipment.

<sup>2</sup> University of Kiel, Germany supported the digital signal processor (DSP), and ETHZ supported the photodetector.

On December 12, 2022, we announced the receipt of U.S. patent number 11,506,918 B2 entitled "Hybrid electro-optic polymer modulator with atomic layer deposition (ALD) sealant layer," which allows our proprietary polymers to be sealed to moisture and atmospheric gases in a very low temperature and quasi-hermetic environment through the use of a chip-scale packaging approach that can be applied in parallel at wafer level (i.e. in volume) and that eliminates the need for a separate hermetic enclosure or "gold box." Specifically, our electro-optic polymer modulators will be sealed with low-temperature conformal atomic layer deposition dielectric layers that are supported on a silicon substrate with passive silicon photonics waveguides. The sealant process will enable lower cost system implementation in a high-volume foundry environment.

On December 13, 2022, we provided a world-class figure-of merit performance for modulators using electro-optical polymers and a plasmonic device design in conjunction with Polariton Technologies. Building from the world record performance and demonstration of a 250 GHz super high bandwidth electro-optical-electrical (EOE) link that was presented at the 2022 European Conference on Optical Communications (ECOC)<sup>3</sup> through a collaboration with ETH Zurich, these latest figure of merit results show the potential for extreme power savings for optical network equipment and demonstrated clearly that polymer-based technology platforms are positioned well for general implementation. These results were achieved using Polariton's electro-optic polymer-based plasmonic devices with Lightwave's electro-optic materials, with a bandwidth greater than 250 GHz. While these high-speed results have been reported previously, here Lightwave Logic reported for the first time that the voltage-length product Figure of Merit (FoM) for this modulator is just 60 Vum, which is approximately 10X better than the performance of the optical semiconductor modulators that are incumbent in the optical network and internet today. This figure of merit will allow ultra-low voltage operation and, enabled by Polariton's plasmonic modulator, the ability to carry significantly more data per modulator while consuming much less power. The net positive effect on system level equipment is expected not only to be significant, but perhaps more importantly, also a strong driver of a "green photonics" platform. These results position our Company extremely well for next generation ultra-high-capacity interconnects for the hyper-scale market. The combination of electro-optic polymers and plasmonics is becoming an ideal sunrise technology platform to address the 'Achilles heel' of the data industry: high power consumption. As the industry contemplates the implementation of PAM4 200G lanes for 2023 and 2024, these optical devices already have shown capability for at least 2X these lane speeds.

On January 12, 2023, our Chief Executive Officer, Dr. Michael Lebby, hosted a presentation and participated in an industry panel discussion at the 2023 Photonics Spectra Conference, a prominent virtual conference within the photonics industry. In the panel discussion, Dr. Lebby and a panel of industry experts from the entire photonics integrated chip (PIC) value chain, discussed lessons learned when scaling PIC production for volume applications. In his presentation, Dr. Lebby reviewed the potential solutions that electro-optical polymer modulators offer to integrated and hybrid photonics integrated chips (PICs), discussing their relevance to PIC packaging operations as well as how electro-optic polymers boost PIC speed and power efficiency.

On January 30, 2023, our Chief Executive Officer, Dr. Michael Lebby, participated in an industry panel discussion at the 2023 Laser Focus World Executive Forum. The Laser Focus World Executive Forum is one of the industry's premier events for senior-level executives, technology directors, and business managers from technology companies around the world, delivering an in-depth analysis of the global laser and photonics market. In this discussion, Dr. Lebby joined a panel of industry experts to discuss how the success of Silicon Photonics is based on the premise that it is a semiconductor technology, and hence it can be manufactured in volume by semiconductor fabs. The panel addressed the manufacturing plans of photonic integrated circuits (PICs) by semiconductor fabs and how the photonic industry can transfer their processes to the semiconductor industry.

On March 22, 2023, we announced that our latest commercial-class electro-optic polymer material achieved breakthrough performance metrics at 1310 nanometers (nm), a wavelength popular in hyperscale datacenter applications. These commercial-class improvements include a significantly higher electro-optic coefficient exceeding 200 pm/V, which allows for very low drive power of 1 volt or less. Other characteristics include optimized chromophore loading, superior low optical loss, excellent temporal stability at 85<sup>0</sup> Celsius, and extremely high thermal and photo stability. The breakthrough commercial-class electro-optic material is expected to enable ultra-small footprint modulators with at least 100 GHz bandwidth as well as meeting all critical requirements for pluggable transceivers, on-board optics and co-packaging solutions. Additionally, the achievement of these results at the 1310nm bandwidth positions us for potential near-term licensing opportunities in datacenter applications.

In April 2023, our Chief Executive Officer, Dr. Michael Lebby, co-chaired the Photonic Integrated Circuits (PIC) International Conference in Brussels, Belgium. Industry-leading insiders delivered more than 30 presentations spanning six sectors at the conference. The conference provided attendees with an up-to-date overview of the status of the global photonics industry as well as the opportunity to meet many other key players within the community. In addition to serving as co-chair of the event, Dr. Lebby hosted a presentation for in-person attendees within the "Scaling PICs in Volume Using Foundries" track, focusing on the industry's consideration of electro-optic polymer modulators due to their increased modulation speed, lower power consumption, and potential for future multi-Tbps aggregated data-rates in the next decade. Additionally, Dr. Lebby discussed the latest results on foundry fabricated EO polymers, as well as the latest work in photonics roadmaps on both the integrated photonics (PIC) level as well as PIC packaging level.

<sup>3</sup> The groundbreaking results were presented by Stefan Koepfli (ETH Zurich) as part of a peer-reviewed post-deadline paper presented at the prestigious 2022 European Conference on Optical Communications (ECOC) in Basel, Switzerland on September 22, 2022. The post-deadline paper is titled ">500 GHz Bandwidth Graphene Photodetector Enabling Highest-Capacity Plasmonic-to-Plasmonic Links."

On May 4, 2023, we announced, that in conjunction with our research partners at the Karlsruhe Institute of Technology and Solarix, the achievement of record optical modulator performance using our Company's latest Perkinamine® Series 5 material at extremely low cryogenic temperatures, delivering the potential to revolutionize applications in supercomputers, quantum circuits and advanced computing systems. Building from the world record performance and demonstration of super high bandwidth, and super low voltage electro-optic modulators with Karlsruhe Institute of Technology and Solarix over the past year, the results have the potential to enable supercomputing and quantum systems to be more competitive than standard computational systems given its faster speeds at low temperatures. This achievement opens huge opportunities to our Company in the areas of supercomputing and quantum systems by giving access to very high data rate, low power optical modulators.

On May 18, 2023, we announced the receipt of U.S. patent number 11,614,670 B2 entitled "Electro-optic polymer devices having high performance claddings and methods of preparing the same," which is a cutting-edge design technique, enhancing the performance of polymer modulators through the use of innovative polymer cladding design that is amenable for high-volume foundry fabrication when integrated with silicon photonics. The patent details a novel fabrication process that allows our proprietary polymers to perform more effectively and to be fabricated by silicon foundries in a high-volume manufacturing environment. It also introduces a more efficient process for improving the performance of the polymer claddings, leading to increased poling efficiency and lower losses in both optical and RF aspects. This patent is helping us move forward with our commercial discussions through the enabling of enhanced performance and simplified manufacturing of our polymer modulators with silicon photonics.

On May 25, 2023, we announced our Company's first commercial material supply license agreement for our Perkinamine® chromophore materials. This agreement is to provide Perkinamine® chromophore materials for polymer based photonic devices and photonic integrated circuits (PICs). Supplying licensed materials is one prong of our Company's three-prong revenue model and business strategy that includes polymer modulator products as well as technology transfer. This agreement recognizes market acceptance and competitive advantage of our technology and validates the first prong of our business model. Further, it represents tangible commercial progress for electro-optic polymers as part of our business plan.

On May 31, 2023, we announced the receipt of U.S. patent number 11,661,428 entitled "Nonlinear Optical Chromophores, Nonlinear Optical Materials Containing the Same, and Uses Thereof in Optical Devices," which details an innovative organic chromophore design using a novel 'thiophene bridge' to significantly improve material performance in a production environment. This is accomplished by designing thiophene-containing bridging groups that are positioned between the electron-donating and electron-accepting ends of the chromophore. These designs provide nonlinear optical chromophores with significantly improved optical properties and improved stability. We expect this patent will help us progress our commercial discussions with potential customers.

In June 2023, we announced the publication of World International Property Organization (WIPO) PCT Patent Publication - PCT Patent No. WO 2023/102066 entitled "Nonlinear Optical Materials Containing High Boiling Point Solvents, and Methods of Efficiently Poling The Same," which illustrates novel organic chemical structural designs that offer increased poling efficiency, as well as thermal stability for electro-optic materials. These designs provide non-linear optical chromophores

with significantly improved material properties and stability for processing and fabrication by commercial foundries. Specifically, the patent teaches material processing and poling methods that directly leads to significantly enhanced electro-optic efficiency (r33) as compared to previous poling techniques. We consider this WIPO PCT Patent Publication to be a strong step forward in the scaling and volume commercialization of our polymer technology platform.

On August 1, 2023, we appointed respected industry executive Laila Partridge to our Board of Directors. Ms. Partridge brings over 30 years of executive experience in technology, corporate innovation and finance to our Board – having worked with a wide range of technologies, including telecommunications, internet infrastructure, AI, internet of things and more. She was named by Boston Business Journal as one of the ten "2017 Women to Watch in Science and Technology". She currently serves as Founder and Chief Executive Officer of The HardTech Project, a new venture with a novel approach to early-stage hardware investing. Previously, she was Managing Director of the STANLEY + Techstars Accelerator where she directed a global effort for Stanley Black & Decker's Chief Technology Officer to identify and invest in innovative technologies for industrial applications with an emphasis on electrification, sustainability and advanced manufacturing. Prior to that, she began her technology career at Intel Capital, serving as a Director of Strategic Investments. Ms. Partridge began her career at Wells Fargo, where she ultimately achieved the role of VP of Corporate Banking, having led complex corporate finance transactions for the company's senior secured debt agencies in the Midwest. Ms. Partridge brings significant board experience to the Board of Directors, including at Intel Capital serving privately-held technology companies, and in her current role as an independent Director at Cambridge Trust (NASDAQ: CATC). She holds a Bachelor's degree with Honors from Wellesley College.

On August 21, 2023, we announced the completion of new laboratory production facilities, expanding our corporate headquarters by over 65%, nearly 10,000 square feet, for a total of approximately 23,500 square feet to support new commercial activity, including enabling commercial device testing and evaluation, production reliability testing, laser characterization, SEM analysis and the expansion of our Company's chemical synthesis production line.

On October 3, 2023, we announced our receipt of the 2023 Industry Award for Most Innovative Hybrid PIC/Optical Integration Platform from the European Conference on Optical Communications (ECOC) – a premier industry exhibition – held in Glasgow, Scotland from October 2-4, 2023. ECOC is one of the leading conferences on optical communication and attracts top industry minds from across the world. The ECOC awards emphasize technology and product commercialization, highlighting significant achievements in advancing the business of optical communications, transport, networking, fiber-based products, photonic integration circuits and related developments. The Innovative Product category with 5 subcategories looks across the industry at new products driving change in their respective market segment, and what is timely and helping to increase the use of optics. Metrics include design features that are photonics, electronics, thermal, mechanical, chemical, environmental and carbon footprint based.

As we move forward to diligently meet our goals, we continue to work closely with our packaging and foundry partners for 112Gbaud prototypes, and we are advancing our reliability and characterization efforts to support our prototyping. Depending on electrical encoding schemes such as PAM4, or PAM8, or wavelength optical multiplexing, these Gigabaud rates roughly translate to 200Gbps and 300Gbps per lane, and are the key speed rates for emerging 800Gbps to future possible 1200Gbps applications. Our partnership with silicon-based foundries will allow us to scale commercial volumes of electro-optic polymer modulator devices using large silicon wafers, and we are currently working to have our fabrication processes accepted into foundry PDKs (process development kits). These are the recipes that foundries use to manufacture devices in their fabrication plants.

We are actively engaged with test equipment manufacturers of the most advanced test equipment to test our state-of-the-art polymer devices. We continue to engage with multiple industry bodies to promote our roadmap. We continue to fine tune our business model with target markets, customers, and technical specifications. Our business model includes the licensing of our strong IP and Patent portfolio, as well as technology transfer to entities such as foundries. Discussions with prospective customers are validating that our modulators are ideally suited for the datacenter and telecommunications markets that are over 10km in length. Details and feedback of what these prospective customers are seeking from a prototype are delivered to our technical team.

#### Capital Requirements

We commenced commercial operations in May 2023 and we do not generate sufficient revenues to pay for our operating expenses. 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.

#### Results of Operations

##### Comparison of three months ended September 30, 2023 to three months ended September 30, 2022

###### Revenues

The Company's first commercial agreement occurred in May 2023 from a material supply and license agreement (the "License Agreement") that incorporates the Company's patented electro-optic polymer materials for use in manufacturing photonic devices (the "Licensed Product"). All revenues are recognized over time commencing with the Company's first commercial agreement in May 2023. No revenues were recognized for the three-month period ending September 30, 2023 since the licensee did not requisition material as of September 30, 2023. An up-front licensing fee in the amount of \$50,000 was paid during the three-month period ending June 30, 2023 and is recorded in short term liability deferred revenue in the Company's balance sheet as of September 30, 2023. During October 2023, the licensee requisitioned material under the License Agreement. The Company will recognize related revenue during the quarter ending December 31, 2023.

###### Operating Expenses

	For the Three Months Ending September 30, 2023	For the Three Months Ending September 30, 2022	Change from Prior Three Month Period	Percent Change from Prior Three Month Period
Research and development	\$ 4,040,941	\$ 3,587,692	\$ 453,249	13%
General and administrative	\$ 1,345,335	\$ 1,144,624	\$ 200,711	18%
	<b>\$ 5,386,276</b>	<b>\$ 4,732,316</b>	<b>\$ 653,960</b>	<b>14%</b>

Research and development expenses increased for the three months ended September 30, 2023, as compared to the three months ended September 30, 2022, primarily due to increases in research and development salary expenses, research and development non-cash stock option and RSA amortization, rent expense, recruiting fees, chemistry and wafer fabrication materials and supplies and research and development consulting expenses, offset by decreases in prototype device development and research and development travel expenses.

Research and development salary expenses increased by \$509,236 in the three months ended September 30, 2023, compared to the same period in 2022. Research and development non-cash stock option and RSA amortization expenses increased by \$154,175 in the three months ended September 30, 2023, compared to the same period in 2022. Rent expense increased by \$87,689 in the three months ended September 30, 2023, compared to the same period in 2022. Recruiting fees increased by \$34,315 in the three months ended September 30, 2023, compared to the same period in 2022. Chemistry and wafer fabrication materials and supplies increased by \$26,352 in the three months ended September 30, 2023, compared to the same period in 2022. Research and development consulting expenses increased by \$13,236 in the three months ended September 30, 2023, compared to the same period in 2022. These increases were offset by a decrease in prototype device development expenses of \$385,725 and a decrease in research and development travel expense of \$24,234 in the three months ended September 30, 2023, compared to the same period in 2022.

We expect to continue to incur substantial research and development expenses developing and commercializing our photonic devices, and electro-optic materials platform. These expenses will increase as a result of accelerated development effort to support commercialization of our non-linear optical polymer materials technology; to build photonic device prototypes; working with semiconductor foundries; hiring additional technical and support personnel; engaging senior technical advisors; pursuing other potential business opportunities and collaborations; customer testing and evaluation; and incurring related operating expenses.

primarily due to increases in general and administrative non-cash stock option and RSA amortization, salary, office expenses, general and administrative consulting fees, rent expense, accounting and software expenses, offset by a decrease in legal fees.

General and administrative non-cash stock option and RSA amortization expenses increased by \$91,667 in the three months ended September 30, 2023, compared to the same period in 2022. Salary expense increased by \$49,153 in the three months ended September 30, 2023, compared to the same period in 2022. Office expenses increased by \$43,880 in the three months ended September 30, 2023, compared to the same period in 2022. General and administrative consulting fees increased by \$37,600 in the three months ended September 30, 2023, compared to the same period in 2022. Rent expense increased by \$29,319 in the three months ended September 30, 2023, compared to the same period in 2022. Accounting expenses increased by \$27,564 in the three months ended September 30, 2023, compared to the same period in 2022. Software expenses increased by \$26,479 in the three months ended September 30, 2023, compared to the same period in 2022. Legal expenses decreased by \$130,025 in the three months ended September 30, 2023, compared to the same period in 2022.

#### Other Income (Expense)

	For the Three Months Ending September 30, 2023	For the Three Months Ending September 30, 2022	Change from Prior Three Month Period	Percent Change from Prior Three Month Period
Other Income/(Expense)	\$ 221,685	\$ (71,067)	\$ 292,752	412%

Other income increased for the three months ended September 30, 2023, as compared to the three months ended September 30, 2022, primarily due to an increase in interest income earned on money market account of \$220,025 and a decrease in commitment fee associated with the purchase of shares by an institutional investor for sale under a stock purchase agreement in the amount of \$47,868.

#### Net Loss

	For the Three Months Ending September 30, 2023	For the Three Months Ending September 30, 2022	Change from Prior Three Month Period	Percent Change from Prior Three Month Period
Net Loss	\$ 5,164,591	\$ 4,803,383	\$ 361,208	8%

Net loss was \$5,164,591 and \$4,803,383 for the three months ended September 30, 2023 and 2022, respectively, for an increase of \$361,208 due primarily to increases in salaries, non-cash stock option and RSA amortization expense, rent expense, consulting fees, office expense, research and development recruiting fees, accounting fees, software expense and wafer fabrication materials and supplies expenses, offset by decreases in prototype device development expenses, legal fees, commitment fee associated with the purchase of shares by an institutional investor for sale under a stock purchase agreement and research and development travel expenses and an increase in other income resulting from interest income earned on money market account.

#### Results of Operations

##### Comparison of nine months ended September 30, 2023 to nine months ended September 30, 2022

###### Revenues

The Company's first commercial agreement occurred in May 2023 from a material supply and license agreement (the "License Agreement") that incorporates the Company's patented electro-optic polymer materials for use in manufacturing photonic devices (the "Licensed Product"). All revenues are recognized over time commencing with the Company's first commercial agreement in May 2023. No revenues were recognized for the nine month period ending September 30, 2023 since the licensee did not requisition material as of September 30, 2023. An up-front licensing fee in the amount of \$50,000 was paid during the nine month period ending September 30, 2023 and is recorded in short term liability deferred revenue in the Company's balance sheet as of September 30, 2023. During October 2023, the licensee requisitioned material under the License Agreement. The Company will recognize related revenue during the quarter ending December 31, 2023.

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###### Operating Expenses

	For the Nine Months Ending September 30, 2023	For the Nine Months Ending September 30, 2022	Change from Prior Nine Month Period	Percent Change from Prior Nine Month Period
Research and development	\$ 12,006,758	\$ 8,994,047	\$ 3,012,711	33%
General and administrative	\$ 3,879,515	\$ 3,017,191	\$ 862,324	29%
	<u>\$ 15,886,273</u>	<u>\$ 12,011,238</u>	<u>\$ 3,875,035</u>	<u>32%</u>

Research and development expenses increased for the nine months ended September 30, 2023, as compared to the nine months ended September 30, 2022, primarily due to increases in research and development salary expenses, research and development non-cash stock option and RSA amortization, recruiting fees, employee relocation expenses, chemistry and wafer fabrication materials and supplies, research and development consulting expenses, testing expenses and rent expense.

Research and development salary expenses increased by \$1,216,792 in the nine months ended September 30, 2023, compared to the same period in 2022. Research and development non-cash stock option and RSA amortization expenses increased by \$785,224 in the nine months ended September 30, 2023, compared to the same period in 2022. Recruiting fees increased by \$201,541 in the nine months ended September 30, 2023, compared to the same period in 2022. Employee relocation expenses increased by \$178,626 in the nine months ended September 30, 2023, compared to the same period in 2022. Chemistry and wafer fabrication materials and supplies increased by \$141,719 in the nine months ended September 30, 2023, compared to the same period in 2022. Research and development consulting expenses increased by \$124,930 in the nine months ended September 30, 2023, compared to the same period in 2022. Research and development testing expenses increased by \$106,604 in the nine months ended September 30, 2023, compared to the same period in 2022. Rent expense increased by \$98,267 in the nine months ended September 30, 2023, compared to the same period in 2022.

We expect to continue to incur substantial research and development expenses developing and commercializing our photonic devices, and electro-optic materials platform. These expenses will increase as a result of accelerated development effort to support commercialization of our non-linear optical polymer materials technology; to build photonic device prototypes; working with semiconductor foundries; hiring additional technical and support personnel; engaging senior technical advisors; pursuing other potential business opportunities and collaborations; customer testing and evaluation; and incurring related operating expenses.

General and administrative expenses increased for the nine months ended September 30, 2023, as compared to the nine months ended September 30, 2022, primarily due to increases in general and administrative non-cash stock option and RSA amortization, legal fees, general and administrative consulting fees, D&O insurance expenses, accounting fees, general and administrative salary expenses, investor relations expenses, office expenses, rent expense and software expenses.

General and administrative non-cash stock option and RSA amortization expenses increased by \$142,505 in the nine months ended September 30, 2023, compared to the same period in 2022. Legal fees increased by \$136,096 in the nine months ended September 30, 2023, compared to the same period in 2022. General and administrative consulting fees increased by \$104,100 in the nine months ended September 30, 2023, compared to the same period in 2022. D&O insurance expenses increased by \$96,839 in the nine months ended September 30, 2023, compared to the same period in 2022. General and administrative salary expenses increased by \$68,267 in the nine months ended September 30, 2023, compared to the same period in 2022. Accounting fees increased by \$67,798 in the nine months ended September 30, 2023, compared to the same period in 2022. Investor relations expenses increased by \$54,714 in the nine months ended September 30, 2023, compared to the same period in 2022. Office expenses increased by \$52,693 in the nine months ended September 30, 2023, compared to the same period in 2022. Software expenses increased by \$31,155 in the nine months ended September 30, 2023, compared to the same period in 2022.

## Other Expense

	For the Nine Months Ending September 30, 2023	For the Nine Months Ending September 30, 2022	Change from Prior Nine Month Period	Percent Change from Prior Nine Month Period
Other Expense	\$ (212,083)	\$ (150,504)	\$ (61,579)	41%

Other expenses increased for the nine months ended September 30, 2023, as compared to the nine months ended September 30, 2022, primarily due to an increase in commitment fee associated with the purchase of shares by an institutional investor for sale under a stock purchase agreement in the amount of \$426,701 offset primarily by a higher interest income earned on money market account in the amount of \$337,454.

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## Net Loss

	For the Nine Months Ending September 30, 2023	For the Nine Months Ending September 30, 2022	Change from Prior Nine Month Period	Percent Change from Prior Nine Month Period
Net Loss	\$ 16,098,356	\$ 12,161,742	\$ 3,936,614	32%

Net loss was \$16,098,356 and \$12,161,742 for the nine months ended September 30, 2023 and 2022, respectively, for an increase of \$3,936,614 due primarily to increases in salary expense, non-cash stock option and RSA amortization, commitment fee associated with the purchase of shares by an institutional investor for sale under a stock purchase agreement, research and development recruiting fees, research and development employee relocation costs, chemistry and wafer fabrication materials and supplies, consulting fees, testing expenses, rent, D&O insurance, legal fees, accounting fees, investor relations fees, office expenses and software expenses offset by a decrease primarily related to a higher interest income earned on money market account.

## Liquidity and Capital Resources

### Sources and Uses of Cash

Our primary source of operating cash inflows was proceeds from the sale of common stock to Lincoln Park pursuant to purchase agreements with the institutional investor and proceeds from sale of common stock by Roth Capital pursuant to the at the market sale agreement with the investment banking company as described in Note 10 to the Financial Statements, proceeds received pursuant to the exercise of options and warrants and a proceed received under a material supply and license agreement which the Company recorded as deferred revenue as of September 30, 2023.

All of the registered shares under the January 21, 2019 purchase agreement with Lincoln Park have been issued as of June 30, 2021. On July 2, 2021, the Company filed a \$100 million universal shelf registration statement which became effective on July 9, 2021. All of the registered shares under the October 4, 2021 purchase agreement with Lincoln Park (the "2021 Purchase Agreement") have been issued as of June 30, 2023. On February 28, 2023, our Company entered into a purchase agreement with Lincoln Park (the "2023 Purchase Agreement") to sell up to \$30 million of common stock over a 36-month period, with \$16.9 million remaining on the 2023 Purchase Agreement as of the date of this filing. On December 9, 2022, our Company entered into the Roth Sales Agreement with Roth Capital, as sales agent, whereby pursuant to the Roth Sales Agreement, our Company may offer and sell up to \$35,000,000 in shares of our common stock, from time to time through Roth Capital. As of the date of this filing \$33.6 million remains available to our Company pursuant to the Roth Sales Agreement.

During the nine months ended September 30, 2023, our Company received \$16,063,909 in proceeds pursuant to the 2021 Purchase Agreement and 2023 Purchase Agreement with Lincoln Park, \$1,378,474 in proceeds pursuant to the Roth Sales Agreement with Roth Capital, \$632,074 in proceeds pursuant to the exercise of options and warrants and \$50,000 in a proceed received under a material supply and license agreement which the company recorded as deferred revenue as of September 30, 2023. During the year ended December 31, 2022, our Company received \$12,775,268 in proceeds pursuant to the 2021 Purchase Agreement with Lincoln Park and \$653,895 in proceeds pursuant to the exercise of options and warrants.

During the nine months ended September 30, 2023, our primary sources of cash outflows from operations included payroll, rent, utilities, payments to vendors including prototypes development and foundries expenses and third-party service providers. During the year ended December 31, 2022, our primary sources of cash outflows from operations included payroll, rent, utilities, payments to vendors including prototypes development and foundries expenses, third-party service providers and payroll taxes related to cashless option exercise.

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 polymer 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 approximately \$1,750,000 of expenditures per month over the next 12 months.

We expect the 2023 Purchase Agreement with Lincoln Park and the Roth Sales Agreement, which we detail below, to provide us with sufficient funds to maintain our operations over that period of time. Our current cash position enables us to finance our operations through April 2025 before we will be required to replenish our cash reserves pursuant to the 2023 Purchase Agreement Lincoln Park or the Roth Sales Agreement. Our cash requirements are expected to increase at a rate consistent with our Company's path to revenue growth as we expand our activities and operations with the objective of commercializing our electro-optic polymer technology. We currently have no debt to service.

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We expect that our cash used in operations will continue to increase during 2023 and beyond as a result of the following planned activities:

- The addition of management, sales, marketing, technical and other staff to our workforce;
- Increased spending for the expansion of our research and development efforts, including purchases of additional laboratory and production equipment;
- Increased spending in marketing as our products are introduced into the marketplace;
- Partnering with commercial foundries to implement our electro-optic polymers into accepted PDKs by the foundries;
- Developing and maintaining collaborative relationships with strategic partners;
- Developing and improving our manufacturing processes and quality controls; and
- Increases in our general and administrative activities related to our operations as a reporting public company and related corporate compliance requirements.

### 2021 and 2023 Purchase Agreements - Lincoln Park

On October 4, 2021, our Company entered into the 2021 Purchase Agreement with Lincoln Park, pursuant to which Lincoln Park agreed to purchase from us up to \$33 million of our common stock (subject to certain limitations) from time to time over a 36-month period. All of the registered shares under the 2021 Purchase Agreement with Lincoln Park have been issued as of June 30, 2023. On February 28, 2023, our Company entered into the 2023 Purchase Agreement with Lincoln Park, pursuant to which Lincoln Park agreed to purchase from us up to \$30 million of our common stock (subject to certain limitations) from time to time over a 36-month period. Pursuant to the 2023 Purchase Agreement, Lincoln Park is obligated to make purchases as the Company directs in accordance with the 2023 Purchase Agreement, which may be terminated by the Company at any time, without cost or penalty. Sales of shares will be made in specified amounts and at prices that are based upon the market prices of our common stock immediately preceding the sales to Lincoln Park. We expect this financing to provide us with sufficient funds to

maintain our operations for the foreseeable future. With the additional capital, we expect to achieve a level of revenues attractive enough to fulfill our development activities and adequate enough to support our business model for the foreseeable future.

There are no trading volume requirements or restrictions under the 2023 Purchase Agreement, and we will control the timing and amount of any sales of our common stock to Lincoln Park. Lincoln Park has no right to require any sales by us, but is obligated to make purchases from us as we direct in accordance with the 2023 Purchase Agreement. We can also accelerate the amount of common stock to be purchased under certain circumstances. There are no limitations on the use of proceeds, financial or business covenants, restrictions on future financings (other than restrictions on the Company's ability to enter into a similar type of agreement or equity line of credit during the term, excluding an at-the-market transaction with a registered broker-dealer), rights of first refusal, participation rights, penalties or liquidated damages in the 2023 Purchase Agreement.

#### *Roth Sales Agreement – Roth Capital*

On December 9, 2022, we entered into the Roth Sales Agreement with Roth Capital, as sales agent. Pursuant to the Roth Sales Agreement, our Company may offer and sell up to \$35,000,000 in shares of our common stock, from time to time through Roth Capital. Upon delivery of a placement notice based on our Company's instructions and subject to the terms and conditions of the Roth Sales Agreement, Roth Capital may sell the shares by methods deemed to be an "at the market offering" as defined in Rule 415(a)(4) promulgated under the Securities Act, including sales made directly on or through The Nasdaq Capital Market, on any other existing trading market for the Company's common stock, in negotiated transactions at market prices prevailing at the time of sale or at prices related to such prevailing market prices, or by any other method permitted by law, including negotiated transactions, subject to the prior written consent of our Company. We are not obligated to make any sales of shares under the Roth Sales Agreement. The Company or Roth Capital may suspend or terminate the offering of shares upon notice to the other party, subject to certain conditions. Roth Capital will act as sales agent on a commercially reasonable efforts basis consistent with its normal trading and sales practices and applicable state and federal law, rules and regulations and the rules of Nasdaq. We have agreed to pay Roth Capital commissions for its services of acting as agent of 3.0% of the gross proceeds from the sale of the shares pursuant to the Roth Sales Agreement.

The amount of proceeds we receive from the Roth Sales Agreement, if any, will depend upon the number of shares of our common stock sold and the market price at which they are sold. There can be no assurance that we will be able to sell any shares under or fully utilize the Roth Sales Agreement. Roth Capital is not required to sell any specific number of shares of our common stock under the Roth Sales Agreement. We intend to use net proceeds from the Roth Sales Agreement for general corporate purposes, including, without limitation, sales and marketing activities, product development, making acquisitions of assets, businesses, companies or securities, capital expenditures, and for working capital needs.

We cannot assure you that we will meet the conditions of the 2023 Purchase Agreement with Lincoln Park in order to obligate Lincoln Park to purchase our shares of common stock, and we cannot assure you that we will be able to sell any shares under or fully utilize the Roth Sales Agreement. In the event we fail to do so, and other adequate funds are not available to satisfy 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.

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#### *Analysis of Cash Flows*

##### *For the nine months ended September 30, 2023*

Net cash used in operating activities was \$9,913,798 for the nine months ended September 30, 2023, primarily attributable to the net loss of \$16,098,356 adjusted by \$5,085,114 in options issued for services, \$198,253 amortization of deferred compensation, \$607,728 in common stock issued for services, \$797,500 in depreciation expenses and patent amortization expenses, \$138,502 amortization of right of use asset, \$581 loss on disposal of property and equipment, \$87,058 in prepaid expenses and (\$730,178) in accounts payable, accrued expenses, deferred revenue and other liabilities. Net cash used in operating activities consisted of payments for research and development, legal, professional and consulting expenses, rent and other expenditures necessary to develop our business infrastructure.

Net cash used by investing activities was \$1,386,164 for the nine months ended September 30, 2023, consisting of \$215,061 in cost for intangibles, \$1,813,818 in asset additions for the Colorado headquarter facility and labs offset by \$642,120 in a loan repayment and \$590 in proceeds on sale of property and equipment.

Net cash provided by financing activities was \$18,074,457 for the nine months ended September 30, 2023 and consisted of \$632,074 in proceeds from exercise of options and warrants, \$16,063,909 in proceeds from resale of common stock to an institutional investor and \$1,378,474 in proceeds from at the market sale of common stock by an investment banking company.

On September 30, 2023, our cash and cash equivalents totaled \$30,876,646, our assets totaled \$39,104,017, our liabilities totaled \$3,683,798 and we had stockholders' equity of \$35,420,219.

##### *For the nine months ended September 30, 2022*

Net cash used in operating activities was \$7,700,332 for the nine months ended September 30, 2022, primarily attributable to the net loss of \$12,161,742 adjusted by \$4,288,172 in options issued for services, \$67,467 amortization of deferred compensation, \$181,027 in common stock issued for services, \$758,285 in depreciation expenses and patent amortization expenses, (\$414,766) in prepaid expenses, (\$536,999) in accounts payable, accrued bonuses and accrued expenses and \$118,224 in cashless option exercise expense. Net cash used in operating activities consisted of payments for research and development, legal, professional and consulting expenses, rent and other expenditures necessary to develop our business infrastructure.

Net cash used by investing activities was \$1,807,415 for the nine months ended September 30, 2022, consisting of \$47,705 in cost for intangibles, \$1,171,530 in asset additions for the Colorado headquarter facility and labs and \$588,180 in a loan issuance.

Net cash provided by financing activities was \$11,096,777 for the nine months ended September 30, 2022 and consisted of \$470,690 in proceeds from exercise of options and warrants, \$10,709,293 in proceeds from resale of common stock to an institutional investor offset by \$83,206 in cashless option exercise tax payments.

On September 30, 2022, our cash and cash equivalents totaled \$25,021,642, our assets totaled \$30,148,946, our liabilities totaled \$1,354,749 and we had stockholders' equity of \$28,794,197.

#### **Contractual Obligations**

On November 22, 2022, our Company entered into an amendment to its operating lease to lease an additional 9,684 square feet of adjacent office and warehouse space that became effective June 1, 2023. See Note 8 - Leases to the financial statements herein for a discussion of the lease amendment. There have been no other material changes outside the ordinary course of business in our contractual commitments during the nine months ended September 30, 2023.

#### **Significant Accounting Policies**

We believe our significant accounting policies affect our more significant estimates and judgments used in the preparation of our financial statements. Our Annual Report on Form 10-K for the year ended December 31, 2022 contains a discussion of these significant accounting policies. The Company's significant accounting policies have not materially changed since that report was filed.

#### **Item 3 Quantitative and Qualitative Disclosures About Market Risk**

At September 30, 2023, we had \$30.9 million in cash and cash equivalents. For the purposes of this Item 3 we consider all highly liquid instruments with maturities of three months or less at the time of purchase to be cash equivalents. The fair value of all of our cash equivalents is determined based on "Level 1" inputs, which are based upon quoted prices for identical or similar instruments in markets that are active. We do not use any market risk sensitive instruments to hedge any risks, and we hold no market risk sensitive instruments for trading or speculative purposes. We place our cash investments in instruments that meet credit quality standards. At September 30, 2023, we had deposits with a financial institution that exceeded the Federal Depository Insurance coverage.

We are exposed to market risk related to changes in interest rates. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates. If a 10% change in interest rates had occurred on September 30, 2023, this change would not have had a material effect on the fair value of our investment portfolio as of that date.

Due to the short holding period of our investments and the nature of our investments, we have concluded that we do not have a material financial market risk exposure.

#### **Item 4 Controls and Procedures**

*Evaluation of Disclosure Controls and Procedures.* The Company's management, with the participation of the Company's Principal Executive Officer and Principal Financial Officer, evaluated the effectiveness of the Company's disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended) as of September 30, 2023. Based on this evaluation, the Company's Principal Executive Officer and Principal Financial Officer concluded that, as of September 30, 2023 the Company's disclosure controls and procedures were effective, in that they provide reasonable assurance that information required to be disclosed by the Company in the reports that it files or submits under the Securities Exchange Act of 1934, as amended, is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms, and is accumulated and communicated to the Company's management, including the Company's Principal Executive Officer and Principal Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

*Changes in Internal Control Over Financial Reporting.* There were no changes in our internal control over financial reporting during the quarter ended September 30, 2023 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

## **PART II – OTHER INFORMATION**

#### **Item 1 Legal Proceedings**

No material legal proceedings.

#### **Item 1A Risk Factors**

In addition to the information set forth in this Form 10-Q, you should carefully consider the risk factors discussed in *Part I, Item 1A. Risk Factors* in our 2022 Form 10-K, which could materially affect our business, financial condition or future results. The risks described in this Form 10-Q and in our 2022 Form 10-K are not the only risks facing our Company. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial may also materially adversely affect our business, financial condition or future results.

#### **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 electro-optic 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 \$5.1 million for the nine months ended September 30, 2023 and a net loss of \$17.2 million for the year ended December 31, 2022 and \$18.6 million for the year ended December 31, 2021. As of September 30, 2023, we had an accumulated deficit of \$122.9 million. We anticipate that we will continue to incur operating losses through at least 2023.

We may not be able to generate significant revenue either through customer contracts for our potential products or technologies or through development contracts from the U.S. government or government subcontractors. 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 revenue to achieve profitability. We cannot assure you that we will ever achieve profitability.

#### **We will require additional capital to continue to fund our operations and 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 have sufficient funds to finance our operations through April 2025; 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. 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. Other than with respect to the 2023 Purchase Agreement and the Roth Sales Agreement; we 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. We currently have a remaining amount of \$16.9 million that is available to our Company pursuant to the 2023 Purchase Agreement with Lincoln Park, and \$33.6 million that is available to our Company pursuant to the Roth Sales Agreement with Roth Capital.

Our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement and involves risks and uncertainties, and actual results could vary as a result of a number of factors, including the factors discussed in our 2022 Form 10-K. We have based this estimate on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect.

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 shareholders may be reduced, and these securities may have rights superior to those of our common stock. If adequate funds are not available to satisfy our long-term capital requirements, or if planned revenues are not generated, we may be required to substantially limit our operations.

#### **Item 2 Unregistered Sales of Equity Securities, Use of Proceeds, and Issuer Purchases of Equity Securities**

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

Date	Security
July 18, 2023	Common Stock — 19,000 shares of common stock at \$0.78 per share pursuant to a warrant exercise.

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(a)(2) and Rule 506 of Regulation D of the Securities Act since the transaction does not involve any public offering.

**Item 3      Defaults Upon Senior Securities**

None.

**Item 4      Mine Safety Disclosures**

Not Applicable.

**Item 5      Other Information***Amendment and Restatement of Bylaws*

On November 9, 2023, the Board of Directors amended and restated the Company's restated bylaws (the " **Bylaws**"), effective immediately, primarily to: (i) amend the advance notice provision for stockholder nominations and proposals, and insert additional provisions, including, (a) updating the deadline for stockholders to submit notice to the Company of nominations and proposals (other than a stockholder proposal submitted under Rule 14a-8 of the Securities Exchange Act of 1934, as amended) to be not less than 120 days nor more than 150 days prior to the one-year anniversary of the Company's proxy statement for the annual meeting for the preceding year, (b) requiring matters to be brought before an annual meeting to be brought only by a stockholder who is a stockholder of record of the Company, (c) requiring the inclusion of certain information about the stockholder and any Interested Person as defined in the Bylaws, (d) compliance with other matters and the submission of certain information, all as more fully described in the bylaws; (iii) amend the range of dates that the Board may fix as the record date for a meeting, (iv) amend the maximum age of directors, (v) amend the voting threshold to remove a director from office, (vi) make other changes to reflect updates in technology, and (vii) make other ministerial and conforming changes.

Pursuant to the Bylaws, stockholder proposals (including recommendations of nominees for election to the board of directors), other than a stockholder proposal submitted pursuant to SEC Rule 14a-8, in order to be voted on at the 2024 Annual Meeting, must be received by us not earlier than November 16, 2023 and not later than December 16, 2023 being, respectively, 150 days and 120 days prior to the one-year anniversary of the Company's proxy statement for the annual meeting for the preceding year.

*Trading Arrangements*

On July 19, 2023, Fred Leonberger, a member of our Company's Board of Directors, adopted a non-Rule 10b5-1 trading arrangement as defined in Item 408(c) of Regulation S-K. The arrangement provided for the sale of 49,000 shares of the Company's common stock and it terminated on July 19, 2023, after all of the shares were sold. The trading arrangement was adopted during an open trading window and satisfied the Company's policies regarding insider transactions.

**Item 6      Exhibits**

The following exhibits are included herein:

Exhibit No.	Description of Exhibit	Location
3.1	<a href="#">Amended and Restated Bylaws</a>	Filed herewith
31.1	<a href="#">Certification pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended, executed by the Principal Executive Officer of the Company.</a>	Filed herewith
31.2	<a href="#">Certification pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended, executed by the Principal Financial Officer of the Company.</a>	Filed herewith
32.1	<a href="#">Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, executed by the Principal Executive Officer of the Company.</a>	Furnished herewith
32.2	<a href="#">Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, executed by the Principal Financial Officer of the Company.</a>	Furnished herewith
101.INS	Inline XBRL Instance Document (the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document)	Filed herewith
101.SCH	Inline XBRL Taxonomy Extension Schema Document	Filed herewith
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document	Filed herewith
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document	Filed herewith
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document	Filed herewith
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document	Filed herewith
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)	Filed herewith

**SIGNATURES**

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

**LIGHTWAVE LOGIC, INC.**

Registrant

By: /s/ Michael S. Lebby

Michael S. Lebby,  
Chief Executive Officer  
(Principal Executive Officer)

Date: November 9, 2023

By: /s/ James S. Marcelli

James S. Marcelli,  
President, Chief Operating Officer

(Principal Financial Officer)

Date: November 9, 2023

**AMENDED AND RESTATED BYLAWS  
OF  
LIGHTWAVE LOGIC, INC.  
A Nevada Corporation**

Lightwave Logic, Inc. (the "Corporation") hereby adopts these Amended and Restated Bylaws, which restate and supersede the Bylaws of the Corporation, as previously amended and restated, in their entirety, as follows:

**ARTICLE I - STOCKHOLDERS**

1. **Annual Meeting.** The annual meeting of stockholders of the Corporation for the election of directors to succeed directors whose terms expire and for the transaction of such other business as may properly come before such meeting shall be held each year at the place, date and time determined by the Board of Directors of the Corporation (the "Board of Directors" or the "Board"). The Board of Directors may postpone, reschedule or cancel any annual meeting of stockholders previously scheduled by the Board.

2. **Special Meetings.** Special meetings of the stockholders for any purpose or purposes, unless otherwise prescribed in the notice of the meeting, may be called by the Chairperson, President or Chief Executive Officer, or by resolution of the Board of Directors or at the request in writing of stockholders owning 66 2/3% in amount of the entire capital stock of the Corporation issued and outstanding and entitled to vote. Such request shall state the purpose of the proposed meeting. The notice for every special meeting shall state the place (if any), date, hour and purposes of the meeting. Except as otherwise required by law, only the purposes specified in the notice of the special meeting shall be considered or dealt with at such special meeting. The Board of Directors may postpone, reschedule or cancel any special meeting of stockholders previously scheduled by the Board.

3. **Place of Meeting.** Meetings of stockholders may be held at such place, either within or without the State of Nevada, as may be designated in the notice of meeting. The Board of Directors may, in its sole discretion, determine that the meeting shall not be held at any place, but may instead be held solely by means of remote communications, including by webcast, in accordance with applicable law. The Board of Directors may also, in its sole discretion, determine that stockholders and proxy holders may attend and participate by means of remote communications in a stockholder meeting held at a designated place. As to any meeting where attendance and participation by remote communications authorized by the Board of Directors in its sole discretion (including any meeting held solely by remote communications), and subject to such guidelines and procedures as the Board of Directors may adopt for any meeting, stockholders and proxy holders not physically present at such meeting of the stockholders shall be entitled to: (i) participate in any meeting of the stockholders; and (ii) be deemed present in person and vote at such meeting of the stockholders whether such meeting is to be held at a designated place or solely by means of remote communications, provided that (A) the Corporation shall implement reasonable measures to verify that each person deemed present and permitted to vote at the meeting by means of remote communications is a stockholder or proxy holder, (B) the Corporation shall implement reasonable measures to provide stockholders and proxy holders a reasonable opportunity to participate in the meeting and to vote on matters submitted to the stockholders, including an opportunity to read or hear the proceedings substantially concurrently with such proceedings, and (C) if any stockholder or proxy holder votes or takes other action at the meeting by means of remote communications, a record of such vote or other action shall be maintained by the Corporation.

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4. **Notice of Meetings.** Except as otherwise provided by law, written notice of each meeting of stockholders shall be given not less than ten (10) nor more than (60) days before the date on which the meeting is to be held to each stockholder entitled to vote at such meeting, such notice to specify the place, if any, date and time of the meeting, the means of remote communications, if any, by which stockholders and proxy holders may be deemed to be present in person and vote at such meeting, and, in the case of a special meeting, the purpose or purposes of the meeting. Without limiting the manner by which notice otherwise may be given to stockholders, any notice shall be effective if given by a form of electronic transmission consented to (in a manner consistent with the Nevada Revised Statutes (the "NRS")) by the stockholder to whom the notice is given, and such notice shall be deemed to be given at the time, if delivered by electronic mail when directed to an electronic mail address at which the stockholder has consented to receive notice, and if delivered by any other form of electronic transmission when directed to the stockholder. Notice of the time, place, if any, and purpose of any meeting of stockholders may be waived (i) in writing signed by the person entitled to notice thereof or (ii) by electronic transmission made by the person entitled to notice, either before or after such meeting. Notice will be waived by any stockholder by his or her attendance theret in person, by remote communications, or by proxy, except when the stockholder attends a meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. Any stockholder so waiving notice of such meeting shall be bound by the proceedings of any such meeting in all respects as if due notice thereof had been given. For purposes of these Bylaws, "electronic transmission" means any form of communication, not directly involving the physical transmission of paper, including the use of, or participation in, one or more electronic networks or databases (including one or more distributed electronic networks or databases), that creates a record that may be retained, retrieved and reviewed by a recipient thereof, and that may be directly reproduced in paper form by such a recipient through an automated process.

5. **Quorum.** The holders of at least one third (33.3%) of all shares of the Corporation's capital stock issued, outstanding and entitled to vote at a meeting, pre person, by means of remote communications, or represented by proxy, shall constitute a quorum for all purposes, unless or except to the extent that the presence of a larger number may be required by law. If, on any issue, voting by the holders of classes or series is required by Chapter 78 or 92A of the NRS, the Articles of Incorporation or these amended and restated bylaws (these "Bylaws"), the holders of at least a majority of the voting power, present in person, by means of remote communications, or represented by proxy, within each such class or series is necessary to constitute a quorum of each such class or series. For purposes of the foregoing, where a separate vote by class or classes is required for any matter, the holders of a majority of the outstanding shares of such class or classes, present in person, by means of remote communications, or represented by proxy, shall constitute a quorum to take action with respect to that vote on that matter. Two or more classes or series of stock shall be considered a single class if the holders thereof are entitled to vote together as a single class at the meeting. The stockholders present at a duly constituted meeting may continue to transact business until adjournment notwithstanding the withdrawal of enough stockholders to reduce the voting shares below a quorum. If a quorum shall fail to attend any meeting, the Chair of the meeting or the holders of a majority of the shares of stock entitled to vote who are present, in person or by proxy, may adjourn the meeting to another place, date or time.

6. **Adjournments.** Any meeting may be adjourned from time to time by the Chairperson of the Board of Directors, the Chief Executive Officer, or by the vote of holders of a majority of the votes properly cast upon the question, whether or not a quorum is present, to reconvene at the same or some other place, and notice need not be given of any such adjourned meeting if the time, place, if any, thereof, and the means of remote communications, if any, thereof are announced at the meeting at which the adjournment is taken. At the adjourned meeting, the Corporation may transact any business which might have been transacted at the original meeting. If the adjournment is for more than sixty (60) days, or if after the adjournment a new record date is fixed for the adjourned meeting, a notice of the adjourned meeting shall be given to each stockholder of record entitled to vote at the meeting.

7. **Voting and Proxies.**

(a) Unless otherwise provided in Chapter 78 of the NRS, the Articles of Incorporation, or the resolution providing for the issuance of preferred stock or common stock adopted by the Board of Directors pursuant to authority expressly vested in it by the provisions of the Articles of Incorporation (if any such authority is so vested), each stockholder of record, or such stockholder's duly authorized proxy, shall be entitled to one (1) vote for each share of voting stock standing registered in such stockholder's name at the close of business on the record date.

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(b) All matters at any meeting at which a quorum is present, except the election of directors, shall be decided by the affirmative vote of the holders of

majority in voting power of the outstanding shares of capital stock of the Corporation present in person or represented by proxy at the meeting and entitled to vote on the subject matter in question, unless otherwise expressly provided by express provision of the Articles of Incorporation, the rules or regulations of any stock exchange applicable to the Corporation, or any law or regulation applicable to the Corporation or its securities, in which case such different or minimum vote shall be the applicable vote on the matter. The election of directors shall be decided by the affirmative vote of the holders of at least a plurality of the votes of the outstanding shares of common stock present in person or represented by proxy at the meeting and entitled to vote in an election of directors, unless otherwise expressly provided by the Articles of Incorporation. The stockholders do not have the right to cumulate their votes for the election of directors. The Corporation shall not directly or indirectly vote any share of its own stock; provided, however, that the Corporation may vote shares which it holds in a fiduciary capacity to the extent permitted by law.

(c) Stockholders may vote either in person or by written proxy or express directly or by written proxy their consent or dissent to a corporate action taken with meeting. Each such proxy shall be valid until its expiration or revocation in a manner permitted by the laws of the State of Nevada. A duly executed proxy shall be irrevocable if it states that it is irrevocable and if, and only as long as, it is coupled with an interest sufficient in law to support an irrevocable power, regardless of whether the interest with which it is coupled is an interest in the stock itself or an interest in the Corporation generally. A stockholder may revoke any proxy which is not irrevocable by attending the meeting and voting in person or by filing an instrument in writing revoking the proxy or another duly executed proxy bearing a later date with the Secretary of the Corporation. Proxies shall be filed with the secretary of the meeting, or of any adjournment thereof. Except as otherwise limited therein, proxies shall entitle the persons authorized thereby to vote at any adjournment of such meeting.

(d) The Corporation may, and to the extent required by law, shall, in advance of any meeting of stockholders, appoint one or more inspectors to act at the meeting and make a written report thereof. The Corporation may designate one or more persons as alternate inspectors to replace any inspector who fails to act. If no inspector or alternate is able to act at a meeting of stockholders, the person presiding at the meeting may, and to the extent required by law, shall, appoint one or more inspectors to act at the meeting. Each inspector, before entering upon the discharge of his duties, shall take and sign an oath faithfully to execute the duties of inspector with strict impartiality and according to the best of his ability. Every vote taken by ballots shall be counted by an inspector or inspectors appointed by the Chair of the meeting.

(e) All elections shall be determined by a plurality of the votes cast, and except as otherwise required by law, all other matters shall be determined by a majority of the votes cast affirmatively or negatively.

(f) If the name signed on a vote, consent, waiver or proxy appointment does not correspond to the name of its stockholder, the Secretary or other agent authorized to tabulate votes at the meeting may nevertheless, if acting in good faith, accept such vote, consent, waiver or proxy appointment and give it effect as the act of the stockholder if:

(i) The stockholder is an entity and the name signed purports to be that of an officer or agent of that entity;

(ii) The name signed purports to be that of an administrator, executor, guardian or conservator representing the stockholder and, if the Secretary or other agent requests, acceptable evidence of fiduciary status has been presented;

(iii) The name signed purports to be that of a receiver or trustee in bankruptcy of the stockholder, and, if the Secretary or other agent requests, acceptable evidence of this status has been presented;

(iv) The name signed purports to be that of a pledgee, beneficial owner or attorney-in-fact of the stockholder and, if the Secretary or other agent requests, acceptable evidence of the signatory's authority to sign has been presented; or

(v) Two or more persons are the stockholders as co-owners or fiduciaries and the name signed purports to be the name of at least one of the co-owners and the person signing appears to be acting on behalf of all co-owners.

(g) The Secretary or other agent authorized to tabulate votes at the meeting is entitled to reject a vote, consent, waiver or proxy appointment if such agent, acting in good faith, has reasonable basis for doubt about the validity of the signature on it or about the signatory's authority to sign for the stockholder.

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8. **Stockholder Lists.** The officer who has charge of the stock ledger of the Corporation shall prepare and make, at least ten (10) days before every meeting of stockholders, a complete list of the stockholders entitled to vote at the meeting, arranged in alphabetical order, and showing the address of each stockholder and the number of shares registered in the name of each stockholder; provided that such list shall not be required to contain the electronic mail address or other electronic contact information of any stockholder. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting, for a period of at least ten (10) days prior to the meeting, either (i) on a reasonably accessible electronic network, provided that the information required to gain access to such list is provided with the notice of the meeting, or (ii) during ordinary business hours, at the principal place of business of the Corporation. If the meeting is to be held at a place, the list shall also be produced and kept at the time and place of the meeting during the whole time thereof, and may be inspected by any stockholder who is present. If the meeting is to be held solely by means of electronic communication or if attendance at and participation in the meeting is permitted by means of remote communications, then the list shall also be open to the examination of any stockholder during the whole time of the meeting on a reasonably acceptable electronic network, and the information required to access such list shall be provided with the notice of the meeting.

A stockholder may, on written demand, copy the stockholders' list at such stockholders' expense during regular business hours provided that (i) such stockholder's demand is made in good faith and for another purpose; (ii) such stockholder has described with reasonable particularity such stockholder's purpose specified in the written demand; and (iii) the stockholders' list is directly related to the stockholder's purpose.

9. **Action Without a Meeting.** Any action required to be taken at any annual or special meeting of stockholders, or which may be taken at any annual or special meeting of stockholders, may be taken without a meeting, without prior notice and without a vote, if a consent or consents in writing, setting forth the action so taken, shall be signed by stockholders holding at least a majority of the voting power, unless the provisions of the statutes or of the Articles of Incorporation require a greater proportion of voting power to authorize such action in which case such greater proportion of written consents shall be required. In no instance where action is authorized by written consent need a meeting of stockholders be called or notice given.

The written consent shall be delivered to the Corporation by delivery to its registered office, its principal place of business, or an officer or agent of the Corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to the Corporation's registered office shall be made by hand or by certified or registered mail, return receipt requested.

**10. Advance Notice of Stockholder Nominees for Director and Other Stockholder Proposals.**

(a) The matters to be considered and brought before any annual or special meeting of stockholders of the Corporation shall be limited to only such matters, including the nomination and election of directors, as shall be brought properly before such meeting in compliance with the procedures set forth in this Section 10 of Article I.

(b) For any matter to be brought properly before the annual meeting of stockholders, the matter must be (i) specified in the notice of the annual meeting given by or at the direction of the Board of Directors (or a committee thereof), (ii) otherwise brought before the annual meeting by or at the direction of the Board of Directors (or a committee thereof) or (iii) brought before the annual meeting by a stockholder who is a stockholder of record of the Corporation on the date the notice provided for in this Section 10 of Article I is delivered to the Secretary of the Corporation, who is entitled to vote at the annual meeting and who complies with the procedures set forth in this Section 10 of Article I.

In addition to any other requirements under applicable law and these Bylaws, even if such matter is already the subject of any notice to the stockholders or public announcement by the Board of Directors, written notice (the "Stockholder Notice") of any nomination or other proposal must be timely and any proposal, other than a nomination, must constitute a proper matter for stockholder action.

To be timely, the Stockholder Notice must be delivered to the Secretary of the Corporation at the principal executive office of the Corporation not less than 120 days nor more than 150 days prior to the one-year anniversary of the Company's proxy statement for the annual meeting for the preceding year (which, for purposes of the Corporation's first annual meeting of stockholders after its shares of common stock are first publicly traded, has occurred on April 23, 2020); provided, however, that if (and only if) the annual meeting is not scheduled to be held within a period that commences 30 days before such anniversary date and ends within 60 days after such anniversary date (an annual meeting date outside such period being referred to herein as an "Other Meeting Date"), the Stockholder Notice shall be given in the manner provided herein by the close of business on the later of (i) the date 90 days prior to such Other Meeting Date or (ii) the tenth day following the date such Other Meeting Date is first publicly announced or disclosed.

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A Stockholder Notice must contain the following information:

- (i) whether the stockholder is providing the notice at the request of a beneficial holder of shares, whether the stockholder, any such beneficial holder or any nominee has any agreement, arrangement or understanding with, or has received any financial assistance, funding or other consideration from, any other person with respect to the investment by the stockholder or such beneficial holder in the Corporation or the matter the Stockholder Notice relates to, and the details thereof, including the name of such other person (the stockholder, any beneficial holder on whose behalf the notice is being delivered, any nominees listed in the notice and any persons with whom such agreement, arrangement or understanding exists or from whom such assistance has been obtained are hereinafter collectively referred to as "Interested Persons");
- (ii) the name and address of all Interested Persons;
- (iii) a complete listing of the record and beneficial ownership positions (including number or amount) of all equity securities and debt instruments, whether held in the form of loans or capital market instruments, of the Corporation or any of its subsidiaries held by all Interested Persons;
- (iv) whether and the extent to which any hedging, derivative or other transaction is in place or has been entered into within the prior six months preceding the date of delivery of the Stockholder Notice by or for the benefit of any Interested Person with respect to the Corporation or its subsidiaries or any of their respective securities, debt instruments or credit ratings, the effect or intent of which transaction is to give rise to gain or loss as a result of changes in the trading price of such securities or debt instruments or changes in the credit ratings for the Corporation, its subsidiaries or any of their respective securities or debt instruments (or, more generally, changes in the perceived creditworthiness of the Corporation or its subsidiaries), or to increase or decrease the voting power of such Interested Person, and if so, a summary of the material terms thereof;
- (v) a representation that the stockholder is a holder of record of stock of the Corporation that would be entitled to vote at the meeting and intends to appear in person or by proxy at the meeting to propose the matter set forth in the Stockholder Notice;
- (vi) a representation whether any Interested Person, will be or is part of a group that will (x) deliver a proxy statement or form of proxy to holders of at least the percentage of the voting power of the Corporation's outstanding capital stock required to approve or adopt the proposal or elect the nominee or (y) otherwise solicit proxies or votes from stockholders in support of such proposal or nomination;
- (vii) a certification regarding whether the Interested Persons have complied with all applicable federal, state and other legal requirements in connection with the acquisition of shares of capital stock or other securities of the Corporation; and
- (viii) any other information relating to such Interested Persons required to be disclosed in a proxy statement or other filings required to be made in connection with solicitations of proxies for, as applicable, the proposal or for the election of directors in an election contest pursuant to and in accordance with Section 14(a) of the Exchange Act and the rules and regulations promulgated thereunder.

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As used herein, "beneficially owned" has the meaning provided in Rules 13d-3 and 13d-5 under the Exchange Act. The Stockholder Notice shall be supplemented and updated from time to time to the extent necessary so that the information provided or required to be provided in such notice shall be true and correct (x) as of the record date for determining the stockholders entitled to notice of the meeting and (y) as of the date that is 15 days prior to the meeting or any adjournment or postponement thereof, provided that if the record date for determining the stockholders entitled to vote at the meeting is less than 15 days prior to the meeting or any adjournment or postponement thereof, the information shall be supplemented and updated as of such later date.

Any Stockholder Notice relating to the nomination of directors must also contain:

- (i) the information regarding each nominee required by paragraphs (a), (e) and (f) of Item 401 of Regulation S-K adopted by the Securities and Exchange Commission (or the corresponding provisions of any successor regulation);
- (ii) each nominee's signed consent to serve as a director of the Corporation if elected; and
- (iii) whether each nominee is eligible for consideration as an independent director under the relevant standards contemplated by Item 407(a) of Regulation S-K (or the corresponding provisions of any successor regulation).

The Corporation may also require any proposed nominee to furnish such other information, including completion of the Corporation's director's questionnaire, as it may reasonably require to determine whether the nominee would be considered "independent" as a director or as a member of the audit committee of the Board of Directors under the various rules and standards applicable to the Corporation.

Any Stockholder Notice with respect to a matter other than the nomination of directors must contain (i) the text of the proposal to be presented, including the text of any resolutions to be proposed for consideration by stockholders (and, in the event that such proposal is to amend these Bylaws, the language of the proposed amendment) and (ii) a brief written statement of the reasons why such stockholder favors the proposal, including any material interest in such proposal of any Interested Person.

Notwithstanding anything in this Section 10(b) of Article I to the contrary, in the event that the number of directors to be elected to the Board of Directors is increased and either all of the nominees for director or the size of the increased Board of Directors is not publicly announced or disclosed by the Corporation at least 100 days prior to the first anniversary of the preceding year's annual meeting, a Stockholder Notice shall also be considered timely hereunder, but only with respect to nominees for any new positions created by such increase, if it shall be delivered to the Secretary of the Corporation at the principal executive office of the Corporation not later than the close of business on the tenth day following the first date all of such nominees or the size of the increased Board shall have been publicly announced or disclosed.

(c) For any matter to be brought properly before a special meeting of stockholders, the matter must be set forth in the Corporation's notice of the meeting given by or at the direction of the Board of Directors. In the event that the Corporation calls a special meeting of stockholders for the purpose of electing one or more persons to the Board of Directors, any stockholder may nominate a person or persons (as the case may be), for election to such position(s) as specified in the Corporation's notice of the meeting, if the Stockholder Notice required by Section 10(b) of Article I hereof shall be delivered to the Secretary of the Corporation at the principal executive office of the Corporation not later than the close of business on the tenth day following the day on which the date of the special meeting and the nominees proposed by the Board of Directors to be elected at such meeting are publicly announced or disclosed.

(d) For purposes of this Section 10 of Article I, a matter shall be deemed to have been "publicly announced or disclosed" if such matter is disclosed in a press release reported by the Dow Jones News Service, Associated Press or comparable national news service or in a document publicly filed by the Corporation with the Securities and Exchange Commission.

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(e) Only persons who are nominated in accordance with the procedures set forth in this Section 10 of Article I shall be eligible for election as directors of the Corporation. In no event shall the postponement or adjournment of an annual meeting already publicly noticed, or any announcement of such postponement or adjournment, commence a new period (or extend any time period) for the giving of notice as provided in this Section 10 of Article I. This Section 10 of Article I shall not apply to stockholders proposals made pursuant to Rule 14a-8 under the Exchange Act. Nothing in these Bylaws shall be deemed to affect any rights of the holders of any class or series of stock having a preference over shares of common stock of the Corporation as to dividends or upon liquidation to elect directors under specified circumstances.

(f) The person presiding at any meeting of stockholders, in addition to making any other determinations that may be appropriate to the conduct of the meeting, shall have the power and duty to determine whether notice of nominees and other matters proposed to be brought before a meeting has been duly given in the manner provided in this Section 10 of Article I and, if not so given, shall direct and declare at the meeting that such nominees and other matters are not properly before the meeting and shall not be considered. Notwithstanding the foregoing provisions of this Section 10 of Article I, if the stockholder or a qualified representative of the stockholder does not appear at the annual or special meeting of stockholders of the Corporation to present any such nomination, or make any such proposal, such nomination or proposal shall be disregarded, notwithstanding that proxies in respect of such vote may have been received by the Corporation.

11. Organization.

(a) Every meeting of stockholders shall be conducted by an individual appointed by the Board of Directors to be Chair of the meeting or, in the absence of appointment, by the Chairperson, if any, or in the case of a vacancy in the office or absence of the Chairperson, by one of the following officers present at the meeting in the following order: The Chief Executive Officer, the President, any vice presidents in order of their rank, and within each rank, their order of seniority, the Secretary, the Treasurer or, in the absence of such officers, a Chair chosen by the stockholders by the vote of a majority of the votes cast by stockholders present in person or by proxy. The Secretary, or in the absence of the Secretary an Assistant Secretary, shall act as secretary of the meeting, but in the absence of the Secretary and any Assistant Secretary the chairperson of the meeting may appoint any person to act as secretary of the meeting.

(b) The order of business at each such meeting shall be as determined by the chairperson of the meeting. The chairperson of the meeting shall have authority to prescribe such rules, regulations and procedures and to do all such acts and things as are necessary or desirable for the proper conduct of the meeting, including, without limitation, the establishment of procedures for the maintenance of order and safety, limitations on the time allotted to questions or comments on the affairs of the Corporation, restrictions on entry to such meeting after the time prescribed for the commencement thereof and the opening and closing of the voting polls, for each item on which a vote is to be taken.

(c) The inspector or inspectors may (i) ascertain the number of shares outstanding and the voting power of each; (ii) determine the number of shares a meeting and the validity of proxies or ballots; (iii) count all votes and ballots; (iv) determine any challenges made to any determination made by the inspector(s); and (v) certify the determination of the number of shares represented at the meeting and the count of all votes and ballots.

## ARTICLE II - DIRECTORS

1. Powers. The business of the Corporation shall be managed by or under the direction of a Board of Directors who may exercise all the powers of the Corporation except as otherwise provided by law, by the Articles of Incorporation or by these Bylaws. In the event of a vacancy in the Board of Directors, the remaining Directors, except as otherwise provided by law, may exercise the powers of the full Board of Directors until the vacancy is filled.

2. Number, Tenure, and Qualifications.

(a) The number of directors which shall constitute the whole Board shall be at least one. The number of directors may from time to time be increased or decreased by resolution of the Board of Directors to not less than one nor more than nine. The Board of Directors shall be elected at the annual meeting of the stockholders and except as otherwise provided by law, by the Articles of Incorporation or by these Bylaws. Directors shall hold office for a term of three (3) years, as more particularly set forth in paragraph (c) below, and until their successors are duly elected and qualified or until their earlier resignation or removal. Any Director may resign by delivering his or her written resignation to the Chairperson, the Chief Executive Officer or to the President of the Corporation. Such resignation shall be effective upon receipt unless it is specified to be effective at some other time or upon the happening of some other event. Directors need not be stockholders.

(b) Classes of Directors. The board of directors shall be and is divided into three classes, as nearly equal in number as possible, designated: Class I, Class II and Class III. In case of any increase or decrease, from time to time, in the number of directors, the number of directors in each class shall be apportioned as nearly equal as possible. No decrease in the number of directors shall shorten the term of any incumbent director.

(c) Terms of Office. Each director shall serve for a term ending on the date of the third annual meeting following the annual meeting at which such director was elected; *provided, that* each director initially appointed to Class I shall serve for an initial term expiring at the Corporation's first annual meeting of stockholders following the effectiveness of this provision; each director initially appointed to Class II shall serve for an initial term expiring at the Corporation's second annual meeting of stockholders following the effectiveness of this provision; and each director initially appointed to Class III shall serve for an initial term expiring at the Corporation's third annual meeting of stockholders following the effectiveness of this provision; *provided further, that* the term of each director shall continue until the election and qualification of a successor and be subject to such director's earlier death, resignation or removal.

(d) Age. Each director shall be at least eighteen (18) years of age. No director shall be more than eighty (80) years of age unless the maximum age is waived by the majority of directors then in office.

3. Vacancies: Reduction of Board. Subject to the provisions of the Articles of Incorporation, a majority of the Directors then in office, whether less than a quo otherwise, or a sole remaining Director, may fill vacancies in the Board of Directors occurring for any reason and newly created directorships resulting from any increase in the authorized number of Directors. A vacancy or vacancies in the Board of Directors shall be deemed to exist in case of the death, resignation or removal of any directors, or if the authorized number of directors is increased, or if the stockholders fail at any annual or special meeting of stockholders at which any director or directors are elected to elect the full authorized number of directors to be voted for at that meeting. If the Board of Directors accepts the resignation of a director tendered to take effect at a future time, the Board of Directors or the stockholders shall have power to elect a successor to take office when the resignation is to become effective. No reduction of the authorized number of directors shall have the effect of removing any director prior to the expiration of his term of office.

4. Removal. The holders of two-thirds of the outstanding shares of stock entitled to vote may at any time peremptorily terminate the term of office of all or any of the members of the Board of Directors by vote at a meeting called for such purpose or by a written statement filed with the secretary or, in his or her absence, with any other officer. Such removal shall be effective immediately, even if successors are not elected simultaneously.

5. Meetings. Regular meetings of the Board of Directors may be held without notice at such time, date and place (if any) as the Board of Directors may from time determine. Special meetings of the Board of Directors may be called, in writing, by the Chairperson, the Chief Executive Officer, the President, one-third (1/3) of the Directors then in office (rounded up to the nearest whole number) or the sole Director, if applicable), and designating the time, date and place (if any) thereof. Directors may participate in meetings of the Board of Directors by means of conference telephone or similar communications equipment by means of which all Directors participating in the meeting can hear each other, and participation in a meeting in accordance herewith shall constitute presence in person at such meeting.

6. Notice of Meetings. Notice of the time, date and place (if any) of all special meetings of the Board of Directors shall be given to each Director by the Secretary, Assistant Secretary, or in case of the death, absence, incapacity or refusal of such persons, by the officer or one of the Directors calling the meeting. Notice shall be given to each Director in person or by telephone, including a voice messaging system or other system or technology designed to record and communicate messages, facsimile, telegraph, or by electronic mail or other electronic means, during normal business hours, at least twenty-four (24) hours in advance of the meeting, or by written

notice mailed to his or her business or home address at least forty-eight (48) hours in advance of the meeting. Notice need not be given to any Director if a written waiver of notice is executed by him before or after the meeting, or if communication with such Director is unlawful, and will be waived by any director by attendance therat, except when the director attends the meeting for the express purpose of objecting, at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. A notice or waiver of notice of a meeting of the Board of Directors need not specify the purposes of the meeting.

7. **Quorum.** At any meeting of the Board of Directors, a majority of the whole Board of Directors then in office shall constitute a quorum for all purposes. Less a quorum may adjourn any meeting from time to time and the meeting may be held as adjourned without further notice.

8. **Action at Meeting.** At any meeting of the Board of Directors at which a quorum is present, a majority of the Directors present may take any action on behalf of the Board of Directors, unless a larger number is required by law or by the Articles of Incorporation. At any meeting of the Board of Directors, business shall be transacted in such order and manner as the Board may from time to time determine.

9. **Action without a Meeting.** Unless otherwise restricted by the Articles of Incorporation, any action required or permitted to be taken at any meeting of the Board of Directors or committee thereof may be taken without a meeting if all members of the Board of Directors or committee thereof consent thereto in writing or by electronic transmission, and such writings or electronic transmissions are filed with the records of the meetings of the Board of Directors or committee thereof. Such filing shall be in paper form if the minutes are maintained in paper form and shall be in electronic form if the minutes are maintained in electronic form. Such consent shall be treated as a vote of the Board of Directors or committee thereof for all purposes.

10. **Committees.** The Board of Directors, by vote of a majority of the Directors then in office, may establish one or more committees, each committee to consist of one or more Directors, and may delegate thereto some or all of its powers except those which by law or by the Articles of Incorporation may not be delegated. Except as the Board of Directors may otherwise determine, any such committee may make rules for the conduct of its business, but in the absence of such rules its business shall be conducted so far as possible in the same manner as is provided in these Bylaws for the Board of Directors. In the absence of a provision by the Board or a provision in the rules of such committee to the contrary, a majority of the entire authorized number of members of such committee shall constitute a quorum for the transaction of business, unless the committee has only one or two members, in which case a quorum shall be one member, or unless a greater quorum is established by the Board. The vote of a majority of the members present at a meeting of the committee at the time of such vote if a quorum is then present shall be the act of such committee. All members of such committees shall hold their committee offices at the pleasure of the Board of Directors, and the Board of Directors may abolish any committee at any time. Each such committee shall report its action to the Board of Directors who shall have power to rescind any action of any committee without retroactive effect.

11. **Compensation.** Directors who are not salaried officers of the Corporation may receive a fixed sum per meeting attended or a fixed annual sum, or both, or other forms of reasonable compensation as may be determined by resolution of the Board of Directors. All directors shall receive their expenses, if any, of attendance at meetings of the Board of Directors or any committee thereof. Any director may serve the Corporation in any other capacity and receive proper compensation therefor. If the Board of Directors establishes the compensation of directors pursuant to this Section 11, such compensation is presumed to be fair to the Corporation unless proven unfair by a preponderance of the evidence.

12. **Chairperson.** The Chairperson of the Board, if one is elected, shall preside, when present, at all meetings of the stockholders and of the Board of Directors. Chairperson of the Board of Directors shall have such other powers and perform such other duties as the Board of Directors may from time to time designate.

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13. **Protection of Confidential Information; Recusal from Meetings.** Each director acknowledges that as part of his or her service to the Corporation, and the exercise of his or her fiduciary duties on behalf of the Corporation, the director may receive confidential information of the Corporation (and its customers, strategic partners, vendors and suppliers). This confidential information includes, without limitation, nonpublic financial information, business and market strategy reports and presentations, pricing information, research and development activities, plans and strategies (including reports and presentations to the Board of Directors), invention disclosures, patentable and unpatentable inventions, technical specifications and information, and other scientific data, laboratory notebooks, unpublished patent or invention disclosures blueprints, biological and chemical compounds and properties, scientific reports, technical specifications and data, whether in hard copy or electronic media. Each director shall not use or disclose such confidential information for any purpose other than to promote and serve the best interests of the Corporation and its stockholders.

### **ARTICLE III - OFFICERS**

1. **Enumeration.** The officers of the Corporation shall consist of a Chief Executive Officer, a President, a Treasurer and a Secretary, or the equivalent thereof such other officers, including one or more Vice Presidents, Assistant Treasurers and Assistant Secretaries, as the Board of Directors may determine.

2. **Election.** The Chief Executive Officer, President, Treasurer and Secretary shall be elected by the Board of Directors at the meeting of the Board of Directors following the annual meeting of stockholders. Other officers may be chosen by the Board of Directors at such meeting or at any other meeting.

3. **Qualification.** No officer need be a stockholder or Director. Any two or more offices may be held by the same person.

4. **Tenure.** Except as otherwise provided by the Articles of Incorporation, each of the officers of the Corporation shall hold his or her office until his or her successor is duly elected and qualified or until his earlier resignation or removal. Any officer may resign by delivering his or her written resignation to the Chairperson, to the Chief Executive Officer or to the President of the Corporation, and such resignation shall be effective upon receipt unless it is specified to be effective at some other time or upon the happening of some other event. Unless otherwise specified in the written resignation, the acceptance of such resignation shall not be necessary to make it effective. Once delivered, a notice of resignation is irrevocable unless the Board of Directors permits revocation.

5. **Removal.** The Board of Directors may remove any officer with or without cause by a vote of a majority of the entire number of Directors then in office.

6. **Vacancies.** Any vacancy in any office may be filled for the unexpired portion of the term by the Board of Directors.

7. **Chief Executive Officer.** The Board of Directors may elect a chief executive officer who, subject to the direction of the Board of Directors, shall have the ultimate responsibility for the management and control of the business and affairs of the Corporation, and shall perform such other duties and have such other powers which are delegated to him or her by the Board of Directors, these Bylaws or as may be provided by law.

8. **President and Vice Presidents.** The President shall be the chief operating officer of the Corporation and shall have general charge of its business operations subject to the direction of the Board of Directors. The Board of Directors shall have the authority to appoint a temporary presiding officer to serve at any meeting of the stockholders or Board of Directors if the President is unable to do so for any reason.

Any Vice President shall have such powers and shall perform such duties as the Board of Directors may from time to time designate. In the absence of the President or in the event of his or her inability or refusal to act, the Vice President (or in the event there be more than one Vice President, the Vice Presidents in the order designated by the Directors, or in the absence of any designation, then in the order of their election) shall perform the duties of the President, and when so acting, shall have all the powers and responsibilities of and be subject to all the restrictions upon the President.

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9. **Treasurer and Assistant Treasurers.** The Treasurer shall, subject to the direction of the Board of Directors, have general charge of the financial affairs of the Corporation and shall cause to be kept accurate books of account. The Treasurer shall have custody of all funds, securities, and valuable documents of the Corporation, except as the Board of Directors may otherwise provide.

Any Assistant Treasurer shall have such powers and perform such duties as the Board of Directors may from time to time designate.

10. **Secretary and Assistant Secretaries.** The Secretary shall record the proceedings of all meetings of the stockholders and the Board of Directors in books kept for that purpose. In his or her absence from any such meeting an Assistant Secretary, or if he or she is absent, a temporary secretary chosen at the meeting, shall record the proceedings thereof.

The Secretary shall have charge of the stock ledger (which may, however, be kept by any transfer or other agent of the Corporation) and shall have such other duties and powers as may be designated from time to time by the Board of Directors, Chief Executive Officer or the President.

Any Assistant Secretary shall have such powers and perform such duties as the Board of Directors may from time to time designate.

11. Other Powers and Duties. Subject to these Bylaws, each officer of the Corporation shall have in addition to the duties and powers specifically set forth in these Bylaws, such duties and powers as are customarily incident to his or her office, and such duties and powers as may be designated from time to time by the Board of Directors.

12. Compensation. The salaries and compensation of all officers of the Corporation shall be fixed by the Board of Directors.

13. Action with Respect to Securities of other Corporations. Unless otherwise directed by the Board of Directors, the Chief Executive Officer, the President or any officer of the Corporation authorized by the President shall have power to vote and otherwise act on behalf of the Corporation, in person or by proxy, at any meeting of stockholders or with respect to any action of stockholders of any other corporation in which this Corporation may hold securities and otherwise to exercise any and all rights and powers which this Corporation may possess by reason of its ownership of securities in such other corporation.

## **ARTICLE IV - CAPITAL STOCK**

1. Certificates of Stock and Uncertificated Shares. Unless the Board of Directors has provided by resolution that some or all of any or all classes or series of the Corporation shall be uncertificated shares, each stockholder shall be entitled to a certificate of stock of the Corporation in such form as may from time to time be prescribed by the Board of Directors. Any such resolution shall not apply to shares represented by a certificate until such certificate is surrendered to the Corporation. Such certificate shall be signed by the Chairperson or Vice-Chairperson of the Board of Directors or the Chief Executive Officer, President or a Vice President and by the Treasurer or an Assistant Treasurer or the Secretary or an Assistant Secretary. Such signatures may be facsimile. In case any officer, transfer agent or registrar who has signed or whose facsimile signature has been placed on such certificate shall have ceased to be such officer, transfer agent or registrar before such certificate is issued, it may be issued by the Corporation with the same effect as if he or she were such officer, transfer agent or registrar at the time of its issue. Every certificate for shares of stock which are subject to any restriction on transfer and every certificate issued when the Corporation is authorized to issue more than one class or series of stock shall contain such legend with respect thereto as is required by law. The Corporation shall, at the option of the Board of Directors or as otherwise stated in the Articles of Incorporation, be permitted to issue fractional shares.

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2. Record Holders. Except as may otherwise be required by law, by the Articles of Incorporation or by these Bylaws, the Corporation shall be entitled to treat record holder of stock as shown on its books as the owner of such stock for all purposes, including the payment of dividends and the right to vote with respect thereto, regardless of any transfer, pledge or other disposition of such stock, until the shares have been transferred on the books of the Corporation in accordance with the requirements of these Bylaws. It shall be the duty of each stockholder to notify the Corporation of his or her post office address.

3. Record Date. In order that the Corporation may determine the stockholders entitled to notice of or to vote at any meeting of stockholders or any adjournment thereof, or to consent to corporate action in writing without a meeting, or entitled to receive payment of any dividend or other distribution or allotment of any rights, or entitled to exercise any rights in respect of any change, conversion or exchange of stock or for the purpose of any other lawful action, the Board of Directors may fix, in advance, a record date, which shall not precede the date on which it is established, and which shall not be more than sixty (60) nor less than ten (10) days before the date of such meeting, more than ten (10) days after the date on which the resolution fixing the record date for stockholder consent without a meeting is established, nor more than sixty (60) days prior to any other action. In such case, only stockholders of record on such record date shall be so entitled notwithstanding any transfer of stock on the books of the Corporation after the record date.

If no record date is fixed, (a) the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day next preceding the day on which notice is given, or, if notice is waived, at the close of business on the day next preceding the day on which the meeting is held, (b) the record date for determining stockholders entitled to consent to corporate action in writing without a meeting, when no prior action by the Board of Directors is necessary, shall be the first date on which a signed written consent setting forth the action taken or proposed to be taken is delivered to the Corporation by delivery to its registered office in this state, to its principal place of business, or to an officer or agent of the Corporation having custody of the book in which proceedings of meetings of stockholders are recorded, and (c) the record date for determining stockholders for any other purpose shall be at the close of business on the day on which the Board of Directors adopts the resolution relating thereto.

The record date for the determination of stockholders entitled to demand a special stockholders' meeting shall be the date the first stockholder signs the demand.

4. Replacement of Certificates. In case of the alleged loss, destruction or mutilation of a certificate of stock, a duplicate certificate may be issued in place of upon such terms as the Board of Directors may prescribe, and the Corporation may require the owner of the lost, stolen or destroyed certificate, or such owner's legal representative, to give the Corporation a bond sufficient to indemnify it against any claim that may be made against it on account of the alleged loss, theft or destruction of any such certificate or the issuance of such new certificate or uncertificated shares.

## **ARTICLE V - GENERAL PROVISIONS**

1. Principal Office; Registered Agent and Office. The principal office of the Corporation shall be located at the principal place of business or at such other place as the Board of Directors may designate. The Corporation may have such other offices, either within or without the State of Nevada, as the Board of Directors may designate or as the business of the Corporation may require from time to time. The registered office of this Corporation shall be in the State of Nevada. The Board of Directors may appoint a resident agent in any jurisdiction upon whom legal process may be served in any action or proceeding against the Corporation.

2. Distributions. Distributions upon capital stock of the Corporation, subject to the provisions of the Articles of Incorporation, if any, may be declared by the Board of Directors at any regular or special meeting, pursuant to law. Distributions may be paid in cash, in property or in shares of capital stock, subject to the provisions of the Articles of Incorporation.

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3. Reserves. Before payment of any distribution, there may be set aside out of any funds of the Corporation available for distributions such sum or sums as the Board of Directors from time to time, in their absolute discretion, think proper as a reserve or reserves to meet contingencies, or for equalizing distributions or for repairing or maintaining any property of the Corporation or for such other purpose as the Board of Directors shall think conducive to the interest of the Corporation, and the Board of Directors may modify or abolish any such reserve in the manner in which it was created.

4. Checks; Notes. All checks or demands for money and notes of the Corporation shall be signed by such officer or officers or such other person or persons as the Board of Directors may from time to time designate.

5. Fiscal Year. The fiscal year of the Corporation shall be fixed by resolution of the Board of Directors.

6. Corporate Seal. The Board of Directors shall have power to adopt and alter the seal of the Corporation.

7. Notices and Waivers Thereof. Except as otherwise provided by law, the Articles of Incorporation or these Bylaws, whenever by law or under the provisions of the Articles of Incorporation or these Bylaws notice is required to be given to any Director or stockholder, it will not be construed to require personal notice, but such

notice may be given in writing, by mail or courier service, addressed to such Director or stockholder, at the address of such Director or stockholder as it appears on the records of the Corporation, with postage thereon prepaid, and such notice will be deemed to be given at the time when the same is deposited in the United States mail or upon delivery, if given by courier service. Notice to Directors or stockholders may also be given by telephone, telegram, facsimile, electronic mail, electronic transmission or similar medium of communication or as otherwise may be permitted by these Bylaws. If such notice is delivered to a Director or stockholder by electronic mail, such notice shall be deemed given when directed to the electronic mail address provided by such Director or stockholder, and if such notice is delivered by any other electronic transmission, such notice shall be deemed given when directed to such Director or stockholder.

Whenever any notice is required to be given by law or under the provisions of the Articles of Incorporation or these Bylaws, a waiver thereof, in writing, signed by the person or persons entitled to such notice, or a waiver by electronic transmission by the person entitled to such notice, whether before or after the time of the event for which notice is to be given, will be deemed equivalent to such notice. Attendance of a person at a meeting will constitute a waiver of notice of such meeting, except when the person attends a meeting for the sole and express purpose of objecting, at the time of the meeting, to the transaction of any business because the meeting is not lawfully called or convened.

The attendance of a stockholder at a meeting shall be a waiver of each objection to lack of, or defect in, notice of such meeting or of consideration of a particular matter at that meeting, unless the stockholder, at the beginning of that meeting or prior to consideration of such matter, objects to holding that meeting, transacting business at that meeting, or considering the matter when presented at that meeting.

8. Execution of Instruments. All deeds, leases, transfers, contracts, bonds, notes and other obligations authorized to be executed by an officer of the Corporation shall be signed by the Chief Executive Officer, President, Treasurer or Secretary, or by any other officer of the Corporation designated by the Board of Directors or Chief Executive Officer, except as the Board of Directors may generally or in particular cases otherwise determine.

9. Voting of Securities. Unless otherwise provided by the Board of Directors, the Chief Executive Officer, President, Treasurer or Secretary may waive notice on behalf of this Corporation, or appoint another person or persons to act as proxy or attorney in fact for this Corporation with or without discretionary power and/or power of substitution, at any meeting of stockholders or shareholders of any other corporation or organization, any of whose securities are held by this Corporation.

10. Corporate Records. The original or attested copies of the Articles of Incorporation, these Bylaws and the records of all meetings of the incorporator, stock and the Board of Directors and the stock and transfer records, which shall contain the names of all stockholders, their record addresses and the amount of stock held by each, shall be kept at the principal office of the Corporation, at the office of its counsel, or at an office of its transfer agent. The books of the Corporation may be kept at such place or places within or without the State of Nevada at such place or places as may be designated from time to time by the Board of Directors or in these Bylaws.

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11. Articles of Incorporation. All references in these Bylaws to the Articles of Incorporation shall be deemed to refer to the Articles of Incorporation of the Corporation as amended and in effect from time to time.

12. Conflicts. In the event of any conflict between these Bylaws or any stockholders, voting, investor rights or other agreement to which the Corporation and the holders of shares of any class or series of capital stock of the Corporation are a party, then such agreement shall govern. In the event of any conflict between these Bylaws and the Articles of Incorporation, the Articles of Incorporation shall govern.

## ARTICLE VI - INDEMNIFICATION

1. Indemnification of Directors and Officers. The Corporation shall, to the fullest extent permitted by Nevada law, indemnify any person who is or was a director or officer of the Corporation or is or was a director or officer of the Corporation serving at the Corporation's request as a director, officer, employee, or agent of another corporation, partnership, joint venture, trust, or other entity (each such person, an "Indemnitee") against Expenses (as defined herein), including without limitation attorneys' fees, costs, expenses, judgments, fines, and amounts paid in settlement (collectively, "Expenses"), actually and reasonably incurred by the Indemnitee in connection with any threatened, pending, or completed action, suit, or proceeding, whether civil, criminal, administrative, or investigative, whether or not an action, suit or proceeding by or on the right of the Corporation, to which the Indemnitee is, was, or is threatened to be made a party by reason of being an Indemnitee.

2. Indemnification Against Expenses. The Expenses of Indemnitees must be paid or reimbursed by the Corporation or through insurance purchased and maintained by the Corporation or through other financial arrangements made by the Corporation, as they are incurred and in advance of the final disposition of the action, suit, proceeding or claim described in Section 1 of this Article VI, to the fullest extent permitted by Nevada law.

3. Indemnification of Employees and Other Persons. The Corporation may, by action of its Board of Directors and to the extent provided in such action, indemnify employees and other persons as though they were Indemnitees.

4. Insurance. The Corporation may purchase and maintain insurance or make other financial arrangements on behalf of any Indemnitee for any liability asserted against him or her and liability and expenses incurred by him or her in his or her capacity as a director, officer, employee, member, managing member or agent, or arising out of his or her status as such, whether or not the Corporation has the authority to indemnify him or her against such liability and expenses.

5. Non-Exclusivity of Indemnification Rights. The rights of indemnification set out in this Article VI shall be in addition to and not exclusive of any other rights which any Indemnitee may be entitled under the Articles of Incorporation, Bylaws, any other agreement with the Corporation, any action taken by the stockholders or disinterested directors of the Corporation, or otherwise. The indemnification provided under this Article VI shall inure to the benefit of the heirs, executors, and administrators of an Indemnitee.

6. Amendment. The provisions of this Article VI may be amended as provided in Article VII; provided, however, no amendment or repeal of such provisions adversely affects the rights of a director or officer under this Article VI with respect to his or her acts or omissions prior to such amendment or repeal, shall apply to him without his or her consent.

7. No Presumption of Bad Faith. The termination of any proceeding by judgment, order, settlement, conviction or upon a plea of nolo contendere or its equivalent shall not, of itself, create a presumption that the person did not act in good faith and in a manner which the person reasonably believed to be in or not opposed to the best interests of this Corporation, or, with respect to any criminal proceeding, that the person had reasonable cause to believe that the conduct was unlawful.

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8. Survival of Rights. The rights conferred on any person by this Bylaw shall continue as to a person who has ceased to be a director, officer, employee or other agent and shall inure to the benefit of the heirs, executors and administrators of such a person.

9. Amendments to Law. For purposes of this Bylaw, the meaning of "law" within the phrase "to the fullest extent not prohibited by law" shall include, but not be limited to, the Nevada General Corporation Law, as the same exists on the date hereof or as it may be amended; provided, however, that in the case of any such amendment, such amendment shall apply only to the extent that it permits the Corporation to provide broader indemnification rights than the Act permitted the Corporation to provide prior to such amendment.

10. Savings Clause. If this Bylaw or any portion hereof shall be invalidated on any ground by any court of competent jurisdiction, the Corporation shall indemnify each director, officer or other agent to the fullest extent permitted by any applicable portion of this Bylaw that shall not have been invalidated, or by any other applicable law.

11. Certain Definitions. For the purposes of this Section, the following definitions shall apply:

(a) The term "proceeding" shall be broadly construed and shall include, without limitation, the investigation, preparation, prosecution, defense, settlement or appeal of any threatened, pending or completed action, suit or proceeding, whether brought in the right of the Corporation or otherwise and whether civil, criminal, administrative or investigative, in which the director or officer may be or may have been involved as a party or otherwise by reason of the fact that the director or officer is or was a director or officer of the Corporation or is or was serving at the request of the Corporation as a director or officer of another corporation, partnership, joint

venture, trust or other enterprise.

(b) The term "Expenses" shall be broadly construed and shall include, without limitation, all costs, charges and expenses (including fees and disbursements of attorneys, accountants and other experts) actually and reasonably incurred by a director or officer in connection with any proceeding, all expenses of investigations, judicial or administrative proceedings or appeals, and any expenses of establishing a right to indemnification under these bylaws, but shall not include amounts paid in settlement, judgments or fines.

(c) "Corporation" shall mean Lightwave Logic, Inc., a Nevada corporation, and any successor corporation thereof.

(d) Reference to a "director" or "officer" of the Corporation shall include, without limitation, situations where such person is serving at the request of the Corporation as a director or officer of another corporation, partnership, joint venture, trust or other enterprise.

(e) References to "other enterprises" shall include employee benefit plans. References to "fines" shall include any excise taxes assessed on a person with respect to any employee benefit plan. References to "serving at the request of the Corporation" shall include any service as a director, officer, employee or agent of the Corporation which imposes duties on, or involves services by, such director, officer, employee or agent with respect to an employee benefit plan, its participants, or beneficiaries. A person who acted in good faith and in a manner the person reasonably believed to be in the interest of the participants and beneficiaries of an employee benefit plan shall be deemed to have acted in a manner "not opposed to the best interests of the Corporation" as referred to in this Bylaw.

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## ARTICLE VII - AMENDMENTS

These Bylaws may be amended or repealed or additional Bylaws adopted by the stockholders or by the Board of Directors; provided that (a) the Board of Directors may not amend or repeal this Article VII or any provision of these Bylaws which by law, by the Articles of Incorporation or by these Bylaws requires action by the stockholders, and (b) any amendment or repeal of these Bylaws by the Board of Directors and any Bylaw adopted by the Board of Directors may be amended or repealed by the stockholders.

## CERTIFICATION

I, Michael S. Lebby, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Lightwave Logic, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
  - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
  - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
  - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
  - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
  - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
  - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: November 9, 2023

/s/ Michael S. Lebby

Michael S. Lebby,  
Chief Executive Officer  
(Principal Executive Officer)

**CERTIFICATION**

I, James S. Marcelli, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Lightwave Logic, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
  - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
  - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
  - (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
  - (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
  - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
  - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: November 9, 2023

/s/ James S. Marcelli

James S. Marcelli,  
President, Chief Operating Officer  
(Principal Financial Officer)

**CERTIFICATION PURSUANT TO  
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002  
18 U.S.C. SECTION 1350**

In connection with the Quarterly Report on Form 10-Q of Lightwave Logic, Inc. (the "Company") for the period ending September 30, 2023 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Michael S. Lebby, Chief Executive Officer of our Company, certify, pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. Section 1350, that, to my knowledge:

1. The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of our Company.

Date: November 9, 2023

/s/ Michael S. Lebby

Michael S. Lebby,  
Chief Executive Officer  
(Principal Executive Officer)

**CERTIFICATION PURSUANT TO  
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002  
18 U.S.C. SECTION 1350**

In connection with the Quarterly Report on Form 10-Q of Lightwave Logic, Inc. (the "Company") for the period ending September 30, 2023 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, James S. Marcelli, Chief Operating Officer of our Company, certify, pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, 18 U.S.C. Section 1350, that, to my knowledge:

1. The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of our Company.

Date: November 9, 2023

/s/ James S. Marcelli

James S. Marcelli,  
President, Chief Operating Officer  
(Principal Financial Officer)